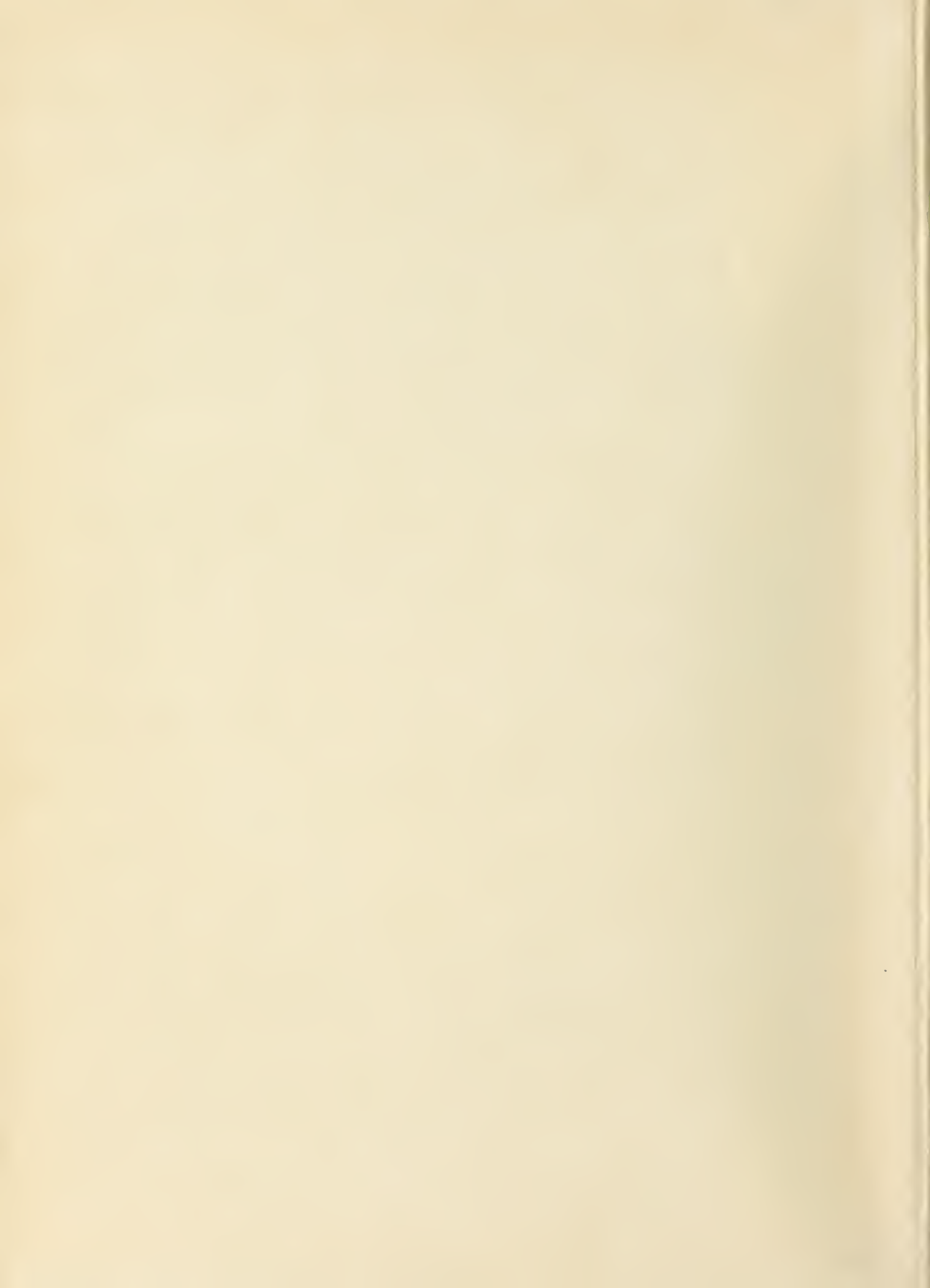
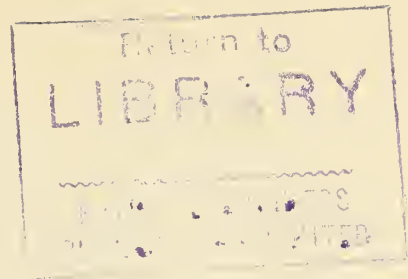




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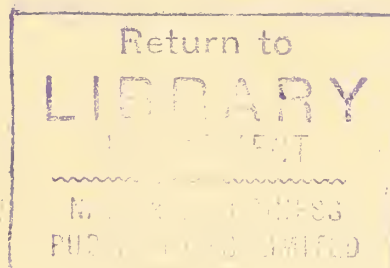




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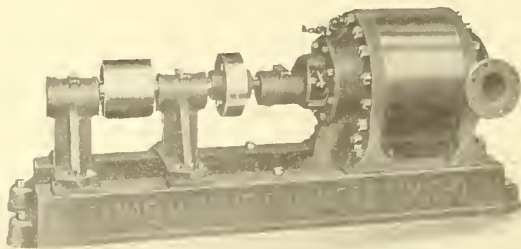


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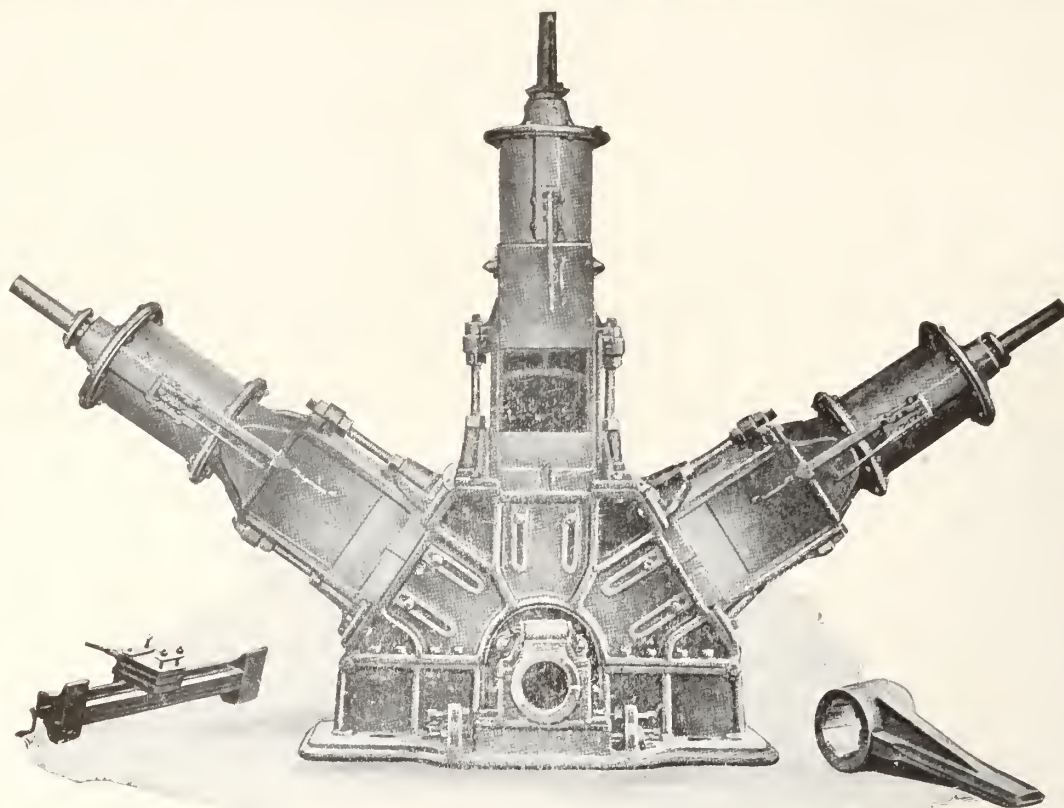
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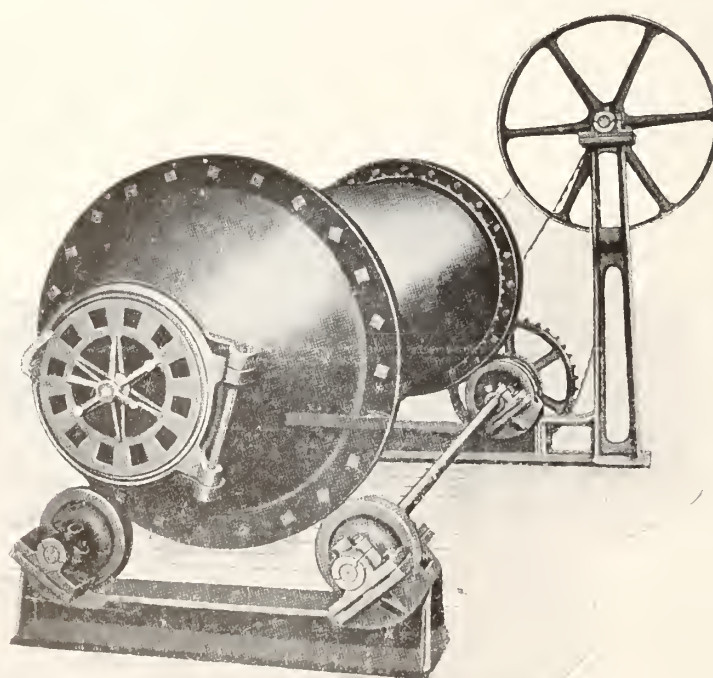
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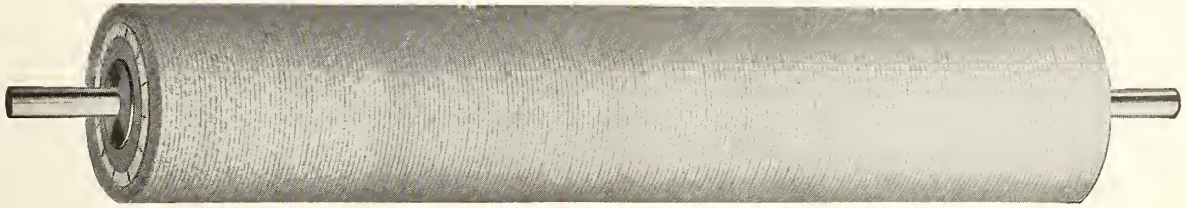
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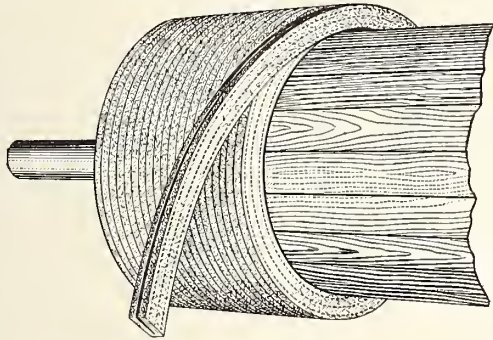


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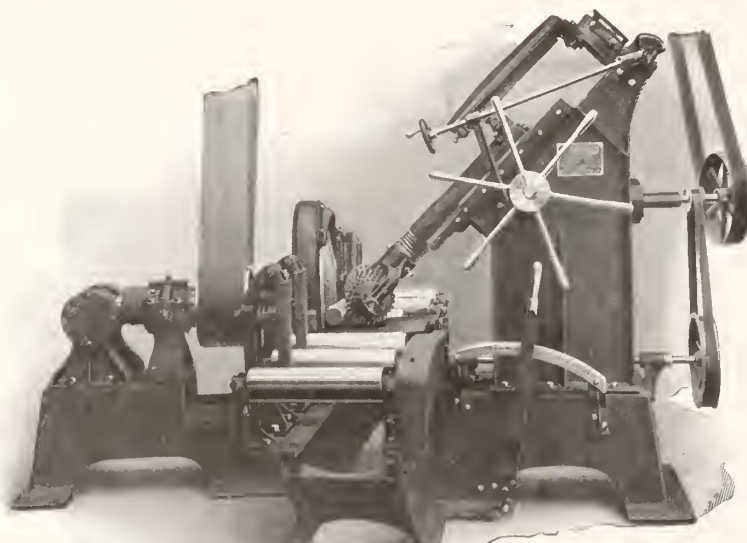
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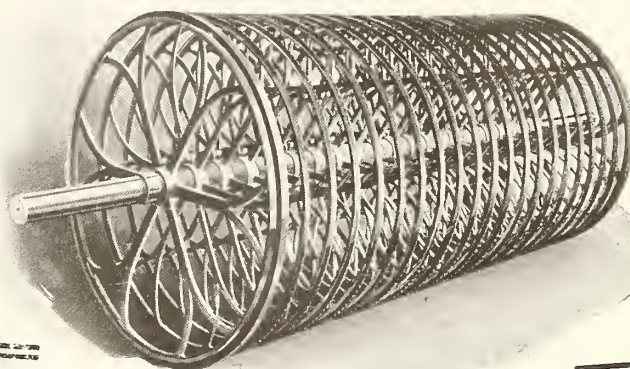
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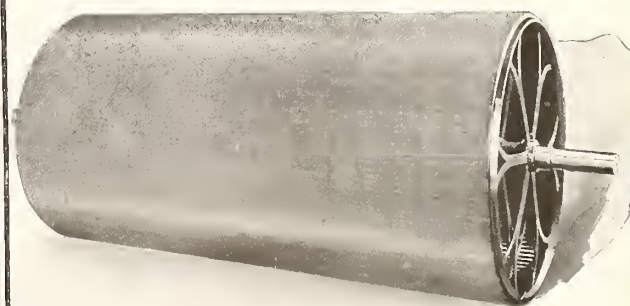
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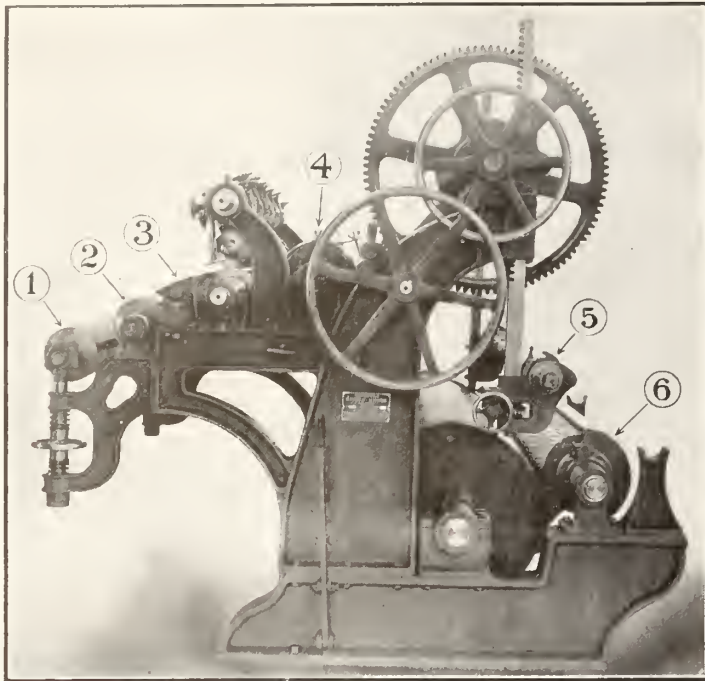
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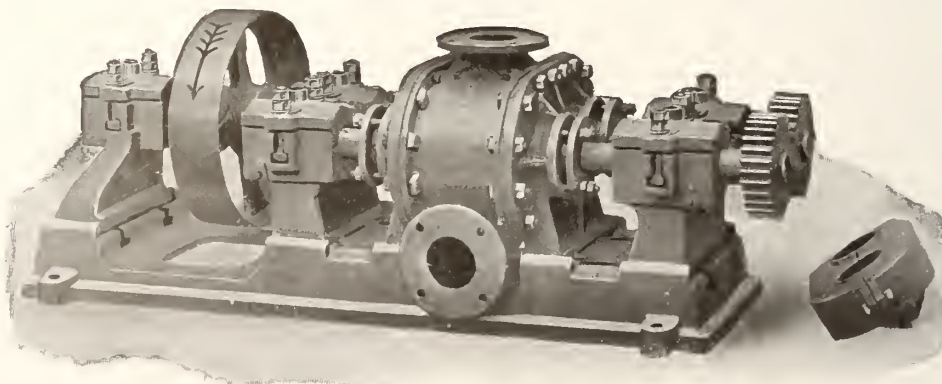
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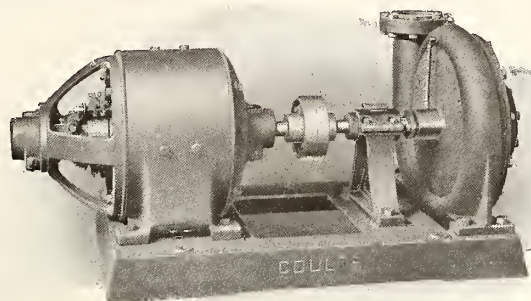
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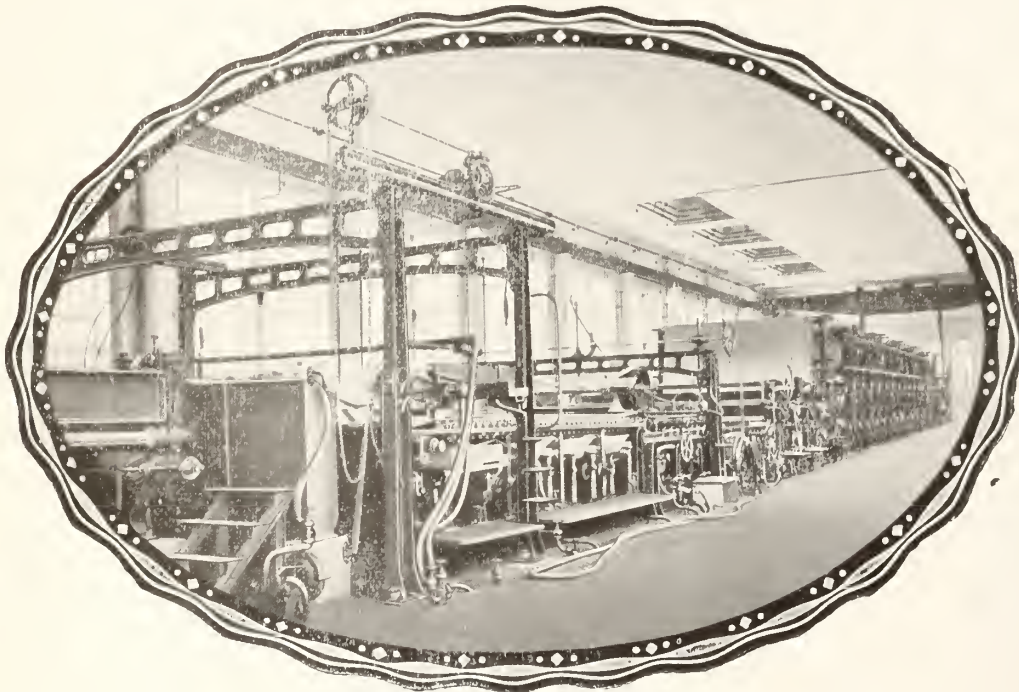
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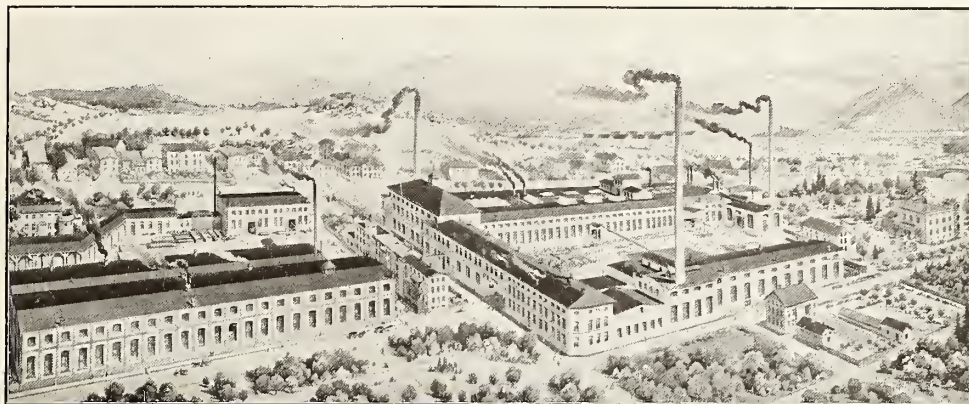
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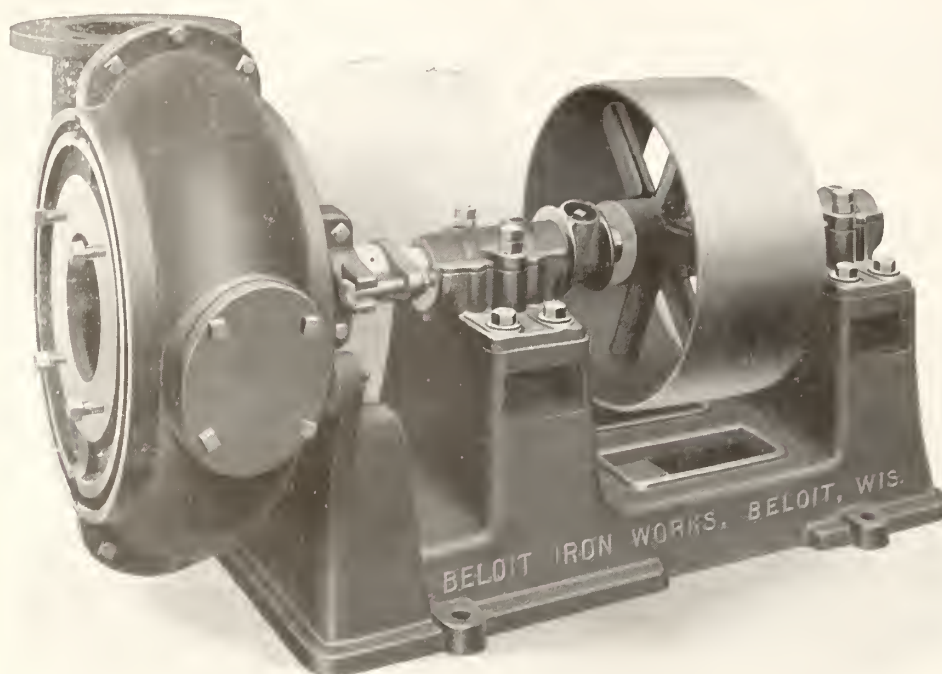
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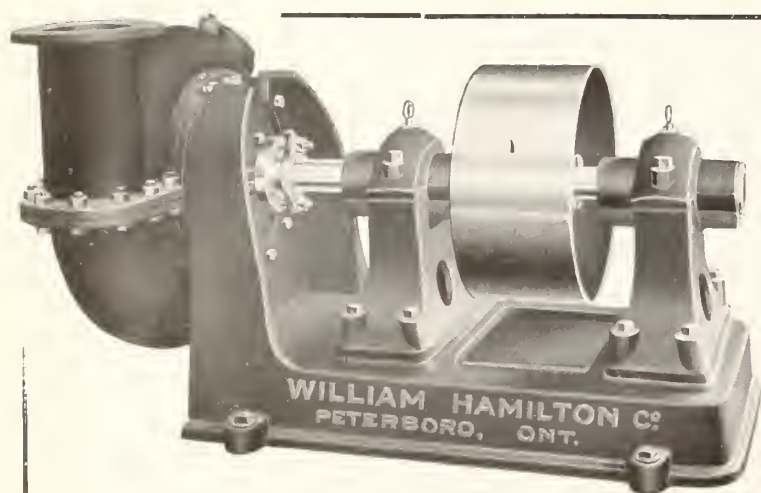
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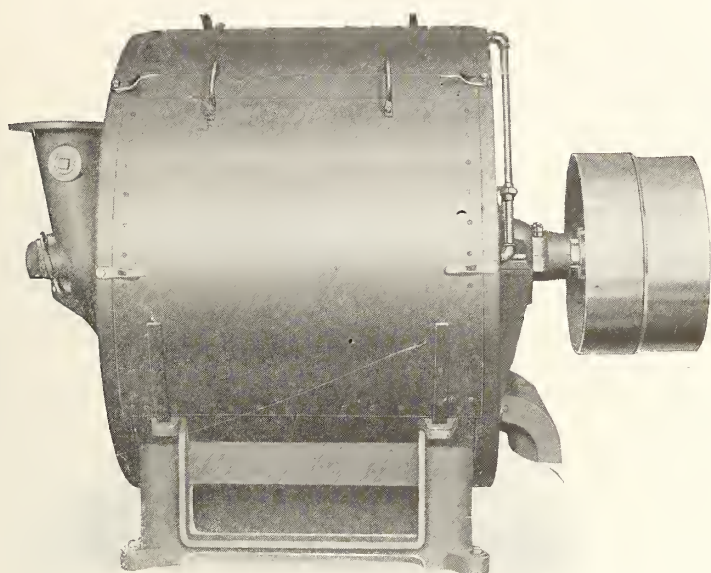
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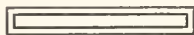
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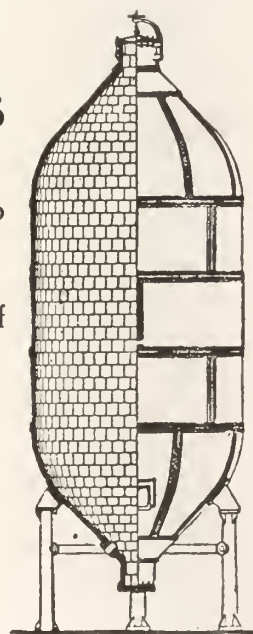
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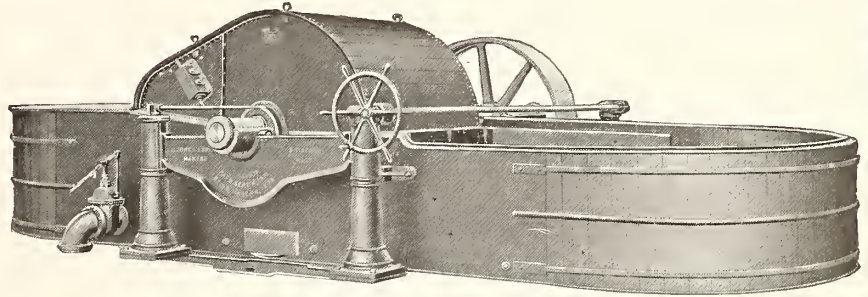


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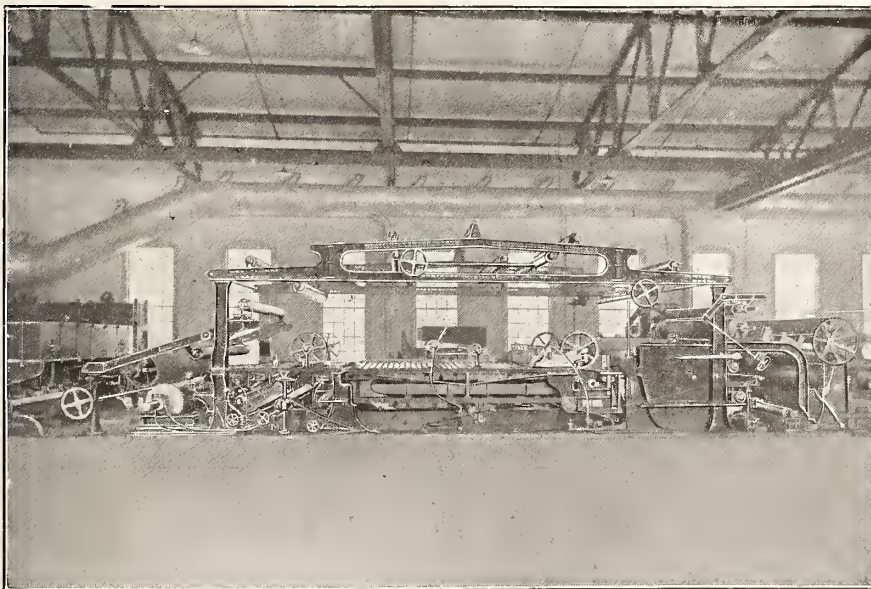
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Roy L. Campbell, B.A., B.Sc. F., Editor

A. G. McIntyre, B.A., B.Sc., Contributing Editor

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MONTREAL, JULY 1, 1914

No. 13

Pulp Wood Consumption

The growth of Canada's pulp industry is strikingly shown in the bulletin of Pulp Wood Consumption issued by the Forestry Branch of the Department of Interior, appearing in this issue of the Pulp and Paper Magazine.

The greatest care has been taken by the Government officials to make the study complete and accurate, and year by year greater reliance can be placed in the figures as approximating very closely the actual conditions. Of course, it is always difficult to secure the most complete data owing to the failure of some mills to send in reports, but that the present compilation covers practically the whole field should be a reason for congratulations to the firms who co-operated in securing these statistics.

There is really just one main conclusion to be drawn from this bulletin, and that is that Canada's pulp industry is growing, and growing very fast. The fact that practically 30 per cent more pulp wood was consumed in mills in 1913 than in 1912 and that in 1913 51.7 per cent of the pulp wood consumed as against 46.9 per cent in 1912 was manufactured into paper in Canadian mills, together with the fact that the sulphite process held its own with one-third of the total consumption of wood and kraft paper increased by over 6 per cent indicate that the industry is making great strides, and that the higher grades of paper are to be largely manufactured.

The increase in price of 51 cents a cord at the mill for raw material is rather disconcerting. This is indicative of a difficulty of obtaining supplies which sooner or later will develop into the state of affairs

which is all too rapidly coming into being in the United States and the Scandinavian countries. Happily, however, Canada, still has sufficient raw material to be able to export irrespective of regulations which should cause the material to be manufactured in the Dominion. This would indicate that we have not yet reached by any means that crisis in which we shall be forced to adopt some means to secure raw material as have these other countries. It is to be hoped that the increase in mills and production of pulp will be maintained and that the economic balance will be reached in which Canada can manufacture all her growth of pulp wood at a profit.

Parliament and Business

Pulp and paper manufacturers have not had any great issues connected with the Federal House during the past session. A few minor changes in departmental regulations and some Orders-in-Council of moderate scope have come into the horizon, but the main interest has centred in the way in which Parliament's acts affect general financial conditions. The principal issue was, of course, the railway problem.

For the Welland ship canal, for the Quebec Bridge, the National Transcontinental, the Intercolonial and the Hudson Bay Railway, the total appropriations made by Parliament this year have amounted to about twenty-six million dollars. If the aid granted to the Canadian Northern System is also taken into account it will be seen that in cash or credit Parliament has voted over seventy million dollars for State or quasi-State-owned railways and canals.

The total appropriation of Parliament for the expenses of administration, and for the great national work, amounts to the record total of \$208,000,000. Of this total approximately fifty-one million dollars is in capital account. One new federal railway undertaking was provided for by a vote of one million dollars to undertake surveys and possibly also construction this year, for the government line approximately 300 miles in length, joining Montreal with the Transcontinental railway.

The Government has also provided in the estimates for important improvements to the Intercolonial Railway and for the construction of branch lines in Nova Scotia a further large amount is provided.

The total expenditure for the year promises to be about \$190,000,000, with revenue, according to present indications about fifteen millions less than last year, or approximately \$150,000,000. The Government however, feels that liberal expenditures are justified under the existing circumstances, and will materially assist in lifting the country over the present period of financial depression. Both the Canadian Northern Railway and the Grand Trunk Pacific Company have received bond guarantees which will enable them to prosecute the completion of their respective transcontinentals without serious interruption.

The indorsing of the bonds has eased the business situation for the present. Already a large order for steel rails has been placed with the rolling mills, and this money will find its way into every industry in the country.

According to the report made by the Minister of Trade and Commerce, Canadian industries are doing well. In his bulletin Sir George Foster shows that in 1914 there was an increase of exports of 57 per cent over 1911. A comparison with last year's trade reports shows a gain of \$75,833,839 in exports of Canadian produce the totals being: 1913 \$355,754,600; 1914, \$431,588,439.

Loans which have been made on mortgage are being well met, according to the mortgage and trust companies, and arrears are in as good shape as at any period during the last five years.

The crop reports are by far the most encouraging which the country has had for years. In the United States there are fully four million acres, and in Canada two million acres more land under cultivation than last year. The harvest will be advanced at least a week, giving greater assurance than ever of plenty of money.

The legislative activity which comes closest to the interest of the pulp and paper industry was the vote of the Senate to amend a bill dealing with matters in the Post Office Department, which contained among other clauses, one which would take out of the hands of Parliament and place in the hands of the Postmaster-General (subject to the approval of the Treasury Board) the power of changing newspaper postage

rates. There was no reason for supposing that the present Postmaster-General would be more disposed than any other Postmaster-General to make exorbitant charges to the Press. But there was a wide-spreading feeling, voiced strongly by the representatives of the Canadian Press Association, that the power was capable of being abused, and that there was no good reason why, in this case, Parliament should surrender its power to any Minister. In an effort to reach a compromise the Postmaster-General agreed to fix a maximum charge beyond which he could not go, and to make rates, when fixed, subject to the approval of the Treasury Board, who were to hear the representations of any parties who might be dissatisfied with the Minister's decision. In this shape the bill came back to the Senate, but was finally thrown out. The universal satisfaction of newspaper men at the action of the Senate, will be shared by the pulp and paper industry.

The Parcel Post

The Parcel Post means an increased use of every form of paper. Mail Order houses print catalogues on coated and fancy papers, the letters of inquiry and reply are written on bond and other papers. Goods are packed in board and corrugated paper, and contained in wrapping and kraft and bound with paper tape and twine. The mail order business of the United States has gone ahead by leaps and bounds with the extensions of the functions of the Post Office and the same will be true in Canada when the parcel post system comes fully into operation.

To the parcel post idea has been added another by the Adams Express Company in the United States. It appears that a serious drawback in the operation of the Parcel Post has been that while the consumer had to deal directly with the producer, neither party has the opportunity as a rule of satisfying itself as to the responsibility of the other. Into this breach the Express Company now steps. It will become, "a clearing-house for excess production, disposing of fruits, berries, butter, eggs poultry, fish, meats and other food articles at a minimum of expense to seller and buyer. The company is responsible to both delivering the commodities to the buyer's door and the money to the seller, without any intervening agency. The rate on the class of merchandise for which the bureau is designed is 25 per cent below the commercial rate fixed by the Interstate Commerce Commission, and is no higher than parcel-post charges. To the cost of carrying must be added the money-order charge, ranging from 3 cents for \$2.50 to 15 cents for \$40."

The company plans such prompt delivery of perishable goods that they will be in the hands of the consumer on the same day that they are shipped from points 200 miles distant, and there is a possibility that the system will be extended to include goods of all kinds.

PULPWOOD CONSUMPTION, 1913

STATISTICS COMPILED BY THE FORESTRY BRANCH, DEPARTMENT OF THE INTERIOR,
OTTAWA.

This bulletin is based on reports received from 48 firms operating pulp mills in Canada in 1913. Altogether 65 mills are operated by these firms as follows: Quebec, 26 firms operating 34 mills; Ontario, 12 firms operating 17 mills; Nova Scotia, 4 firms operating 6 mills; New Brunswick, 4 firms operating 3 mills, and British Columbia 2 firms operating 3 mills.

In addition to these active firms, reports were received from 10 firms whose mills were idle in 1913, and from 5 firms with mills under construction.

The 48 active firms reporting in 1913 consumed in their mills a total of 1,109,034 cords pulpwood valued

at the mill at \$7,243,368. A total of 1,035,030 cords of unmanufactured pulpwood valued at \$7,070,571 was exported from Canada to the United States during the same year, bringing the total production of pulpwood to 2,144,064 cords valued at \$14,313,939.

Pulpwood.

Table 1 shows the quantity, total value and average value per cord of the pulpwood used in each of the provinces of Canada in 1912 and 1913, and the number of active firms reporting in each case.

TABLE I.

Pulpwood, 1912 and 1913, by Provinces, Quantity Cut and Total Value, 1913. Average Value 1912 and 1913, and Per Cent Distribution, 1913.

PROVINCES	No. of Active Firms Reporting 1913	QUANTITY		Per Cent Distribution	Total Value	Average Value Cord	
		1912 Cords	1913 Cords	1913	1913	1912	1913
CANADA	48	866,042	1,109,034	100.0	\$ 7,243,368	\$ c 6.02	\$ c. 6.53
Quebec.....	26	578,855	629,934	56.8	4,107,689	5.85	6.52
Ontario.....	12	173,903	321,244	29.0	2,297,389	7.10	7.15
British Columbia.....	2	35,067	84,173	7.6	401,218	5.51	4.77
New Brunswick.....	4	52,041	53,121	4.8	342,243	5.52	6.44
Nova Scotia.....	4	26,176	20,562	1.8	94,829	4.32	4.61

The quantity of pulpwood consumed in Canadian pulp mills in 1913 was an increase of 28.1 per cent. over that of 1912. The average price of raw pulpwood at the mill increased by 51 cents a cord, making an increase of 38.9 per cent. in the total value of the raw material used in this industry.

Quebec and Ontario still led the other provinces in 1913, as in 1912. British Columbia displaced Nova Scotia from fourth place on the list in 1912 and displaced New Brunswick from third place in 1913. This province now consumes 7.6 per cent. of the pulpwood used in Canada and will probably increase this proportion in the future as the pulp industry on the Pacific Coast is still in its infancy. There was an in-

crease in consumption in every province but Nova Scotia where the closing of four mills resulted in a decrease of 21.4 per cent. The increases were: Quebec, 8.8 per cent.; Ontario, 84.7 per cent.; British Columbia, 140.0 per cent.; New Brunswick, 2.1 per cent.

The average cost of pulpwood at the mill in Canada in 1913 was \$6.53, an increase of 8.5 per cent. from 1912. The cost increased in Quebec, Ontario, New Brunswick and Nova Scotia, and decreased in British Columbia.

Table 2 shows the quantity, value and per cent. distribution of the kinds of wood used in making pulp in Canada in 1913.

TABLE II.

Pulpwood, 1912 and 1913, by Kinds of Wood.—Quantity Cut and Total Value, 1913. Average. Value 1912 and 1913, and Per Cent Distribution, 1913.

KINDS OF WOOD	QUANTITY		Per Cent Distribution	Total Value	Average Value Cord	
	1912 Cords	1913 Cords	1913	1913	1912	1913
TOTAL	866,042	1,109,034	100.0	\$ 7,243,368	\$ c. 6.02	\$ c. 6.53
Spruce.....	677,747	754,858	68.1	5,104,221	6.09	6.76
Balsam Fir.....	164,587	283,292	25.5	1,806,911	5.81	6.38
Hemlock.....	19,178	47,360	4.3	201,480	5.53	4.25
Jack Pine.....	40	19,383	1.7	101,675	4.00	5.25
Poplar.....	4,405	4,141	0.4	29,081	6.21	7.02

Only five kinds of wood were used in the manufacture of pulp in 1913. Spruce headed the list with over two-thirds of the total. The percentage of balsam fir used in pulp making has increased steadily as the prejudices against this wood have been overcome. In 1911 balsam formed 17.5 per cent. of the total; in 1912, 19.0 per cent.; and in 1913, 25.5 per cent. The wood has been found to make excellent pulp, equal in

many cases to that made from spruce alone, but a prejudice existed against its use. Fir generally gives a 10 per cent. lower yield of pulp than spruce and is therefore not so desirable from the mill operator's standpoint.

Table 3 shows the extent to which the five different kinds of wood were used in each province in 1913 in the different processes of pulp manufacture.

TABLE III.

Pulpwood, 1913, by Provinces, Kinds of Wood and Processes: Quantity of Wood Used.

Provinces.....	Total	Spruce	Balsam Fir	Hemlock	Jack Pine	Poplar
TOTAL—ALL PROCESSES						
	Cords	Cords	Cords	Cords	Cords	Cords
Canada.....	1,109,034	754,858	283,292	47,360	19,383	4,141
Quebec.....	629,934	389,523	222,738	705	13,327	3,641
Ontario.....	321,244	259,999	54,165	524	6,056	500
British Columbia....	84,173	39,742	.....	44,431	.....	.....
New Brunswick.....	53,121	48,037	5,084	.....	.....	.....
Nova Scotia.....	20,562	17,557	1,305	1,700	.....	.....
MECHANICAL PROCESS.						
Canada.....	600,216	398,429	182,413	18,894	.....	500
Quebec.....	398,664	243,480	155,184	.....	.....	.....
Ontario.....	135,753	111,413	23,840	.....	.....	500
British Columbia....	38,535	21,341	.....	17,194	.....	.....
Nova Scotia.....	20,562	17,557	1,305	1,700	.....	.....
New Brunswick.....	6,702	4,618	2,084	.....	.....	.....
SULPHITE PROCESS.						
Canada.....	367,105	263,228	74,116	27,761	.....	2,000
Quebec.....	105,650	62,859	40,791	.....	.....	2,000
Ontario.....	175,398	144,549	30,325	524	.....	.....
British Columbia....	45,638	18,401	.....	27,237	.....	.....
New Brunswick.....	40,419	37,419	3,000	.....	.....	.....
SULPHATE PROCESS.						
Canada.....	136,569	90,423	26,763	.....	19,383	.....
Quebec.....	120,476	80,386	26,763	.....	13,327	.....
Ontario.....	10,093	4,037	.....	.....	6,056	.....
New Brunswick.....	6,000	6,000	.....	.....	.....	.....
SODA PROCESS.						
Canada.....	5,144	2,798	.....	705	.....	1,641
Quebec.....	5,144	2,798	.....	705	.....	1,641

The manufacture of ground wood pulp still consumed over half (54.1 per cent.) of the wood used for pulp making in Canada. This percentage has been decreasing in the last few years. The sulphite process, the most important of the chemical processes, was used in converting a third of the total quantity of wood into pulp in 1913. This proportion is practically the same as in 1912.

The increased manufacture of Kraft papers has

caused an increased demand for pulp made by the sulphate process. This process was used with 12.3 per cent. of the pulpwood in 1913, as compared to 7.7 per cent. in 1912. The manufacture of soda pulp has greatly decreased, only 5,144 cords of wood being used for this process.

Table 4 gives a summary of the information contained in the first three tables with some additional details.

TABLE IV.

PULPWOOD, 1913, BY PROVINCES, KINDS OF WOOD AND PROCESSES: Number of Active Firms Reporting, Quantity of Pulpwood Used, Quantity of Pulp Produced, Quantity of Each Kind of Wood Used in Each Process, Total Cost and Average Cost per Cord.

	Total	Quebec	Ontario	British Columbia	New Brunswick	Nova Scotia
Number of Active Firms Reporting...	48	26	12	2	4	4
Pulp Produced:						
Aggregate.....Tons	854,624	514,299	228,498	61,354	29,911	20,562
Mechanical.....	600,216	398,664	135,753	38,535	6,702	20,562
Sulphite....."	183,552	52,825	87,699	22,819	20,209	.....
Sulphate....."	68,284	60,238	5,046	.....	3,000	.....
Soda....."	2,572	2,572	.....	.....	.....	.....
Wood Used:						
Aggregate.....Cords	1,109,034	629,934	321,244	84,173	53,121	20,562
Aggregate Cost.....	\$7,243,368	\$4,107,689	\$2,297,389	\$401,218	\$342,243	\$94,829
Average Cost.....	\$6.53	\$6.52	\$7.15	\$4.77	\$6.44	\$4.61
Spruce:						
Total.....Cords	754,858	389,523	259,999	39,742	48,037	17,557
Total Cost.....	\$5,104,221	\$2,623,437	\$1,871,023	\$214,607	\$312,735	\$82,419
Average Cost.....	\$6.76	\$6.73	\$7.20	\$5.40	\$6.51	\$4.69
Mechanical....Cords	398,409	243,480	111,413	21,341	4,618	17,557
Sulphite....."	263,228	62,859	144,549	18,401	37,419	.....
Sulphate....."	90,423	80,386	4,037	.....	6,000	.....
Soda....."	2,798	2,798	.....	.....	.....	.....
Balsam Fir:						
Total.....Cords	283,292	222,738	54,165	.....	5,084	1,305
Total Cost.....	\$1,806,911	\$1,374,315	\$397,478	.....	\$29,508	\$5,610
Average Cost.....	\$6.38	\$6.17	\$7.34	.....	\$5.80	\$4.30
Mechanical....Cords	182,413	155,184	23,840	.....	2,084	1,305
Sulphite....."	74,115	40,791	30,325	.....	3,000	.....
Sulphate....."	26,763	26,763	.....	.....	.....	.....
Hemlock:						
Total.....Cords	47,360	705	524	44,431	.....	1,700
Total Cost.....	\$201,480	3,877	\$4,192	\$186,611	.....	\$6,800
Average Cost.....	\$4.25	\$5.50	\$8.00	\$4.20	.....	\$4.00
Mechanical....Cords	18,894	.....	.....	17,194	.....	1,700
Sulphite....."	27,761	.....	524	27,237	.....	.....
Soda....."	705	705	.....	.....	.....	.....
Jack Pine:						
Total.....Cords	19,383	13,327	6,056	.....	.....	.....
Total Cost.....	\$101,675	\$80,479	\$21,196	.....	.....	.....
Average Cost.....	\$5.25	\$6.04	\$3.50	.....	.....	.....
Sulphate.....Cords	19,383	13,327	6,056	.....	.....	.....
Poplar:						
Total.....Cords	4,141	3,641	500	.....	.....	.....
Total Cost.....	\$29,081	\$25,581	\$3,500	.....	.....	.....
Average Cost.....	\$7.02	\$7.03	\$7.00	.....	.....	.....
Mechanical....Cords	500	.....	500	.....	.....	.....
Sulphite....."	2,000	2,000	.....	.....	.....	.....
Soda....."	1,641	1,641	.....	.....	.....	.....

The 48 active firms reporting pulp manufacture in 1913 operate altogether 65 different pulp mills. These firms each used on an average 23,105 cords of wood as compared to 18,042 in 1912. Each one of the individual 65 mills consumed an average of 17,062 cords of pulpwood. The largest individual mills are situated in British Columbia where the average mill consumption was 28,058 cords. Quebec has the greatest number of mills, and the average consumption of these was 18,527 cords. The average mill consumption in the other provinces was as follows: Ontario, 18,897 cords; New Brunswick, 13,280 cords; and Nova Scotia, 5,140 cords.

The figures given in Table 4 for pulp produced are estimated from the quantities of pulpwood consumed and the method of manufacture. One cord of wood is

assumed to produce one ton of ground wood pulp or one-half ton of chemical fibre, air dry.

(Air dry pulp is assumed to contain 10 per cent of moisture and 90 per cent bone dry fibre.)

So many conditions affect the average price of pulpwood that the figures given above cannot be taken too literally. Some mills purchase pulpwood on the open market and pay high prices for it plus the cost of transportation. Other firms own their limits and pay only the cost of cutting and transporting the material. The prices, however, can be depended upon to indicate any important change from year to year.

Table 5 shows the extent to which Canada exports raw or unmanufactured pulpwood. The figures are based on information received from the Department of Customs for the calendar years 1912 and 1913.

TABLE V.

CANADIAN PULPWOOD EXPORTED UNMANUFACTURED vs. THAT MANUFACTURED IN CANADA, 1912 and 1913:
Quantity, Average Value per Cord, and Per Cent Distribution.

	1912				1913			
	Quantity	Value	Val. per Cord	Per Cent	Quantity	Value	Val. per Cord	Per Cent
	Cords	\$	\$ c.		Cords	\$	\$ c.	
Canada:								
Production.....	1,846,910	11,911,415	6 45	100 0	2,144,064	14,313,939	6 68	100 0
Manufacture.....	866,042	5,215,582	6 02	46 9	1,109,034	7,243,368	6 53	51 7
Export.....	980,868	6,695,833	6 82	53 1	1,035,030	7,070,571	6 83	48 3
Quebec:								
Production.....	1,330,670	8,371,923	6 29	100 0	1,432,594	9,495,165	6 63	100 0
Manufacture.....	578,855	3,386,705	5 85	43 5	629,934	4,107,689	6 52	44 0
Export.....	751,855	4,985,218	6 63	56 5	802,260	5,387,476	6 71	56 0
Ontario:								
Production.....	246,282	1,692,662	6 87	100 0	405,943	2,822,859	6 95	100 0
Manufacture.....	173,903	1,235,343	7 10	70 6	321,244	2,297,389	7 15	79 1
Export.....	72,379	457,319	6 32	29 4	84,699	525,470	6 20	20 9
New Brunswick:								
Production.....	202,942	1,492,567	7 35	100 0	194,674	1,449,525	7 45	100 0
Manufacture.....	52,041	287,060	5 52	25 7	53,121	342,243	6 44	27 3
Export.....	150,901	1,205,507	7 99	74 3	141,553	1,107,282	7 82	72 3
British Columbia:								
Production.....	35,067	193,265	5 51	100 0	84,242	402,428	4 78	100 0
Manufacture.....	35,067	193,265	5 51	100 0	84,173	401,218	4 77	99 9
Export.....	.....	.....	.....	.....	69	1,210	17 54	0 1
Nova Scotia:								
Production.....	31,949	160,998	5 04	100 0	26,611	143,962	5 41	100 0
Manufacture.....	26,176	113,209	4 32	81 9	20,562	94,829	4 61	77 3
Export.....	5,773	47,789	8 28	18 1	[6,949	49,133	8 12	22 7

In 1912 Canada manufactured 46.9 per cent. of her pulp wood in her own mills. In 1913 this percentage increased to 51.7 per cent., and for the first time in the history of the industry more than half of the pulpwood produced in Canada was manufactured into pulp in Canadian pulp mills.

During 1913 each province, except Nova Scotia, used an increased proportion of its pulpwood for home manufacture. The greatly increased production of pulpwood in British Columbia together with the fact that this province manufactures practically all (99.9 per cent.) of its pulpwood at home, is largely responsible for the increased proportion for the whole of Canada.

Laws exist in Ontario whose strict enforcement has checked the export of raw pulpwood. In this province 79.1 per cent. of the pulpwood is used in home manufacture. The exports of raw pulpwood have increased in Nova Scotia from 0.3 per cent. in 1911 to 22.7 per cent. in 1913. Laws prohibiting the export of raw pulpwood from Crown Lands in Quebec came into force in September 1, 1910. Since that time the export for the province has decreased steadily from 69.4 per cent. in 1910 to 62.0 per cent. in 1911, 56.5 per cent. in 1912, and 56.0 per cent. in 1913. This proportion probably represents approximately the proportion of pulpwood cut on Crown Lands and privately owned limits, and may remain stable for some time. In New Brunswick the restrictive legislation of October 1st, 1911, checked the export of raw material, and in 1913 a slight increase in the proportion of pulpwood consumed in the province is to be noted. This province

still exports a greater proportion of its pulpwood in the raw state than any other.

Canada exported in 1913 to the United States 1,035,030 cords of unmanufactured pulpwood valued at \$7,070,571 or at \$6.83 a cord. Canadian pulp manufacturers operated 65 mills in that year. If the exported material had been manufactured into pulp in Canada it would have been sufficient to supply 60 mills each consuming 17,062 cords of pulpwood, the average consumption of Canada's 65 mills in 1913.

Canadian pulpmill operators paid an average price of \$6.53 per cord for their raw material. The exporters received only 20 cents a cord more than this for the wood sent to the United States.

This 1,035,030 cords of pulpwood, if manufactured into pulp would have made 1,035,030 tons of ground wood, or 517,515 tons of chemical fibre. Groundwood pulp is worth at least \$14.00 a ton, which would give \$14,490,420 as the value of the pulp made from the wood exported in 1913. Had this wood been made into value would have been \$19,665,570. In reality only chemical fibre at an average price of \$38.00 a ton its \$7,070,571 was received for this wood. The pulp industry lost the profit which could have been made by manufacturing this wood into pulp, and the country at large, lost the money which would have represented the cost of manufacture in the form wages, etc.

Wood-Pulp.

Table 6 shows the details of the export of manufactured wood-pulp from Canada in 1912 and 1913. The figures were furnished by the Customs Department.

TABLE VI.

EXPORT OF WOOD-PULP, 1912 and 1913, Quantity, Total Value, Average Value per Ton, Per Cent Distribution, and Countries to which Exported.

Kinds of Pulp and Countries to which Exported	1912				1913			
	Quantity	Value	Av. Val. per Ton	Per Cent	Quantity	Value	Av. Val. per Ton	Per Cent
Wood-Pulp Exported Aggregate.....	384,100	5,952,361	17.10	100.0	298,169	5,913,560	19.83	100.0
Total Mechanical Pulp.....	295,449	3,991,365	13.51	84.9	230,644	3,317,565	14.38	77.4
Total Chemical Pulp.....	52,651	1,960,996	37.24	15.1	67,525	2,595,995	38.44	22.6
Total to United States.....	218,936	4,525,569	20.67	62.9	198,110	4,471,939	22.57	66.4
Mechanical.....	167,448	2,607,589	15.57	....	137,922	2,150,227	15.59	....
Chemical.....	51,488	1,917,980	37.25	....	60,188	2,321,712	38.57	....
Total to Great Britain.....	127,981	1,384,893	10.82	36.8	92,916	1,172,750	12.62	31.2
Mechanical.....	127,945	1,383,026	10.81	....	92,722	1,167,338	12.59	....
Chemical.....	36	1,867	51.86	....	194	5,412	27.90	....
Total to Japan.....	1,046	36,665	35.05	0.3	7,031	265,071	37.70	2.4
Mechanical.....	56	750	13.39	....	.....	.....	.....	....
Chemical.....	990	35,915	36.28	....	7,031	265,071	37.70	....
Total to China.....	116	4,294	37.02	*	112	3,800	33.93	*
Chemical.....	116	4,294	37.02	....	112	3,800	33.93	....
Total to New Zealand.....	21	940	44.76	*	.....	.....	.....	....
Chemical.....	21	940	44.76	....	.....	.....	.....	....

* Less than one-tenth of one per cent.

The export of wood-pulp from Canada decreased from 1912 to 1913 by 22.4 per cent. in spite of an increase of 25.2 per cent. in the quantity manufactured. This would seem to indicate increased activity in the domestic manufacture of paper. Decreases are to be noted in the exports of pulp to the United States, Great Britain and China. New Zealand did not import Canadian pulp in 1913. The only increase reported was in the export of chemical pulp to Japan. The United States still takes about two-thirds of our pulp, of which about 70 per cent. is ground wood. Great Britain takes a little less than a third of the total and her importations are almost entirely ground good or mechanical pulp. The exports to Japan and China in 1913 were of chemical fibre only. Altogether 77.4 per cent. of the pulp exported was ground wood and the remaining

22.6 per cent. chemical fibre.

The average price of ground wood pulp increased by 87 cents and that of chemical fibre by \$1.20, from 1912 to 1913. The price of mechanical pulp exported to the United States increased by only 2 cents a ton while the increase to Great Britain was \$1.78. The price of chemical fibre exported to the United States increased by \$1.32 and to Japan by \$2.65. The chemical pulp exported to Great Britain was valued at a little more than half the value in the previous year. A reduction in price of \$3.09 was also reported for the pulp exported to China.

Table 7 gives the details of the imports of wood pulp into Canada from various countries. The figures were supplied by the Customs Department.

TABLE VII.

IMPORTS OF WOOD-PULP, 1912 and 1913: Total Value, Per Cent, Distribution, and Countries from which Imported.

COUNTRIES FROM WHICH IMPORTED	1912		1913	
	Value	Per Cent	Value	Per Cent
Total Value of Imports.....	\$ 172,797	100.0	\$ 356,862	100.0
United States.....	100,234	58.0	303,543	85.1
Sweden.....	64,419	37.3	36,843	10.3
Great Britain.....	4,764	2.7	10,197	2.8
Germany.....	2,546	1.5	3,886	1.1
Norway.....	.....	....	1,387	0.4
Switzerland.....	.....	....	1,006	0.3
Austria-Hungary.....	834	0.5	.....	....

The imports of wood-pulp into Canada in 1913 were valued at \$356,862.00, as compared to \$172,797.00 for 1912. This is an increase of over 100 per cent., the

imports from the United States having more than tripled during 1913. The importation from Great Britain more than doubled and those from Germany increased

by over half those in 1912. The importations of wood-pulp from Sweden decreased by 42.8 per cent. Pulp was imported from Norway and Switzerland in 1913, but not in the previous year. No pulp was imported from Austria Hungary in 1913. The United States in 1913 supplied over four-fifths of the total (85.1 per cent.) as compared to over a half in 1912.

EXTENSION WORK IN FOREST CONSERVATION.

Eight thousand school teachers representing every state in the Union are to receive general instruction in forest conservation at the mid-summer meeting of the American Forestry Association at Chautauqua, New York, on Thursday and Friday, July 9th and 10th.

The teachers will be told how forest fires which now cause an annual loss of seventy human lives and twenty-five million dollars may be prevented by the kind of educational work the Association is doing; and this instruction will be emphasized by moving pictures of forest fires and methods of fighting them.

They will also be told how lumber is made and moving pictures will play a large part in this description,

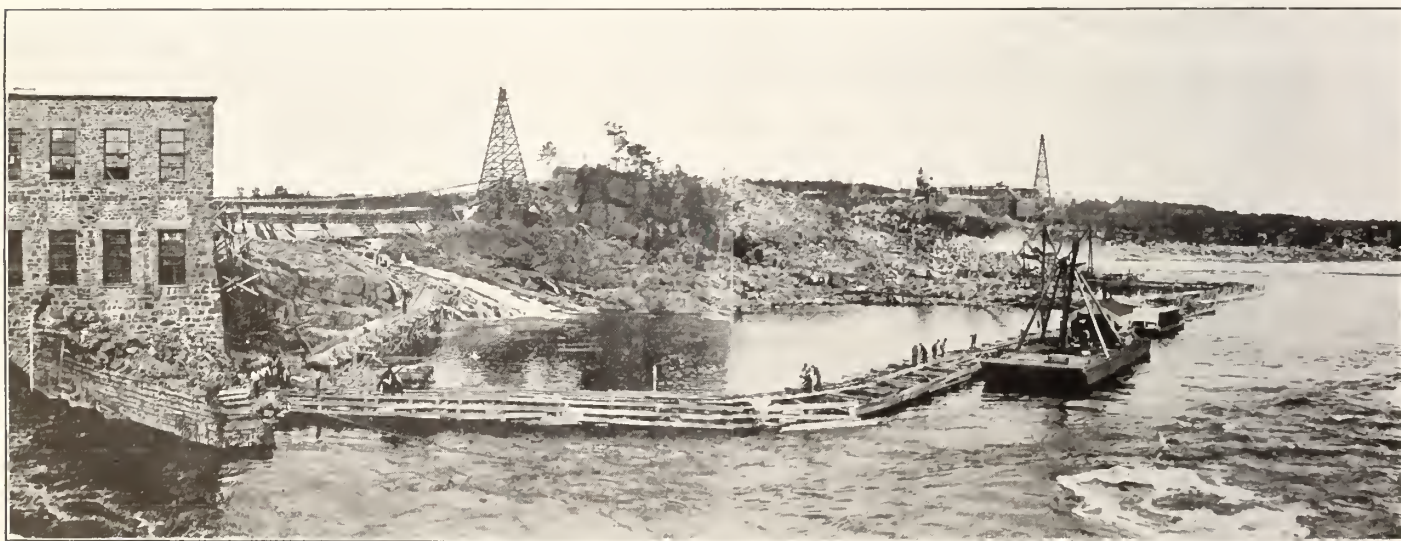
while there will be other pictures graphically showing what the soil, the water and the forests mean to the Nation.

The battle for life which the trees of the forest wage from the time they are tiny seedlings until they have attained their full growth will be described with pictures by Dr. B. E. Fernow, of the University of Toronto, and E. T. Allen, an expert on Pacific Coast forest conditions, will describe to the teachers the close relation between the forests, timber, and the people of the country. Charles Lathrop Pack, a Director of the Association, and former president of the National Conservation Congress, will make an address on forest conservation, and Prof. J. S. Tounney, Director of the Yale Forest School, will discuss the teaching of forestry in the public schools. J. E. Rhodes, of Chicago, in telling how lumber is made, will deal with the problems of the lumbermen. Capt. J. B. White, of Kansas City, will speak on the lumbermen's attitude toward forest conservation, and Dr. Henry Sturgis Drinker, President of the Association and President of Lehigh University, will tell about the work which the Association is doing in educating the people of this country to a proper realization of the value of trees.

POWER DEVELOPMENT AT GRAND' MERE

At Grand Mere on the St. Maurice River, the Laurentide Company is making rapid progress towards the immense task of harnessing the whole breadth of the broad stream which gives power to so many industries in Montreal and other centres. The work, which was

of comparatively still water through which the new dam will be constructed. Heretofore the head of water has been 45 feet made by three dams of 250 ft., 75 ft., and 350 ft. length respectively and on these the Laurentide Company has built up its present busi-



1. As power site appeared July 15th, 1913. From left to right may be seen present power house; present dam; suspension bridge; cable tower; cofferdam (below); main island, crushing and mixing plant; main channel of St. Maurice.

begun in January, 1913, is superseding the original dam and power house which took in the western shore of the river and allowed the main channel to remain unharnessed. The point at which the power development is being conducted is between two islands, one of which is the famous Grand Mere bearing the rock which has a remarkable resemblance to that of an old woman and the other a high rocky island of a triangular shape about 600 feet across. At this point the river is 1100 feet wide with a bay on the eastern side

ness. The change which will be made involves the erection of a power house 457 feet long by 137 feet wide which will extend diagonally across the stream at a point 200 feet further down the river than the present dam and from the channel corner of the power house will extend a dam 1700 feet long which will stretch across the three principal channels and the length of the large island. At the deepest part near the power house, the dam will be 65 feet high and at the shallowest—where the dam will cross the large island—it will

be only 4 or 5 feet high. In order to make the surface regular, a triangular area 400 feet by 300 feet of solid rock will be blown off the top of the island.

This new development is one of the largest in the country. A total head of 77 feet will be maintained

tension rooms. At the top will be the gate house con-



2. The old channel of the St. Maurice, where the first development took place. In the background the Grand Mere Rock. This rock is now being transferred in sections and set up on the hill in the town of Grand Mere.

and with the nine units developing 20,000 horse power each, there will be available a total power of 180,000 horse power, of this only 120,000 horse power will be developed at the present time. The power house will consist of one main containing generators and an upper story with the switchboard, transformer and high



3. Power house excavation with draft tubes practically complete December 5th, 1913.

trolling the spillways for the overflow. The work has gone ahead with full activity under the direction of the George F. Hardy Company, the Consulting Engineers, and the Contractors, The Talbott Construction Co. The beginning was made a year and a half ago when the cofferdam below the falls, the excavation for the tail race and power house were made, and



4. The most recent view of the work, showing the site of the power units.

the construction camps were installed. These construction camps are a unique feature of the work. They are located on the far side of the river from the present mill site and are fully equipped with crushers, blacksmith shops, carpenter shops, stone bins, etc. The rock excavation from the river bed and the island is handled by means of large flat buckets on a heavy cableway 1650 feet long with a $2\frac{3}{4}$ inch cable suspended from towers 150 feet high right across the river. 400 cubic yards of concrete is being mixed and placed daily



5. A close view of a draft tube.

and the excavation and crusher capacities are keeping up with this. The rock is transported to the crushers on the far side of the river and is returned to the construction in the form of concrete by another cable of 1120 feet span which is directly over the dam. Last summer and spring were spent in excavation and a certain amount of concrete work was effected. The steel work on the power house was begun about the first of April and has been proceeding rapidly. At the



6. The operation on October 20th, 1913.

present time the new travelling crane which is to be used for the installation of the power units to be supplied by the I. P. Morris Company is in place and working smoothly. The draft tubes were completed the last of February. At the present time the pen stocks and control department and practically all the concrete foundation for the power house are in place and will bear further development almost immediately. One hundred and seventy-five feet of the dam at the highest part is half completed and a beginning has been

made on the far side of the river clearing out the bank for the purpose of putting in the eastern section of the dam. The mixer is ready to handle this part of the work. The next step will be to put in the cofferdam on the main floor of the river at the wide channel on the east side. At this point the water is about 15 feet deep and running very fast. The installation of the cofferdam will involve a great deal of difficulty. While the working on the dam is completing and the stream is blocked, the water will find its course through a channel which is being excavated through the centre of the island. Down this passage the logs for other firms on the St. Maurice will pass. The force of men, it is expected, will be increased as the work proceeds. In all about 925 are at present employed. It is expected that the work will take close on to a year for completion. When it is finally finished, the St. Maurice Valley can boast of a power plant equal in capacity to that at Keokuk, Iowa, which dammed the whole Mississippi and cost nearly thirty million dollars. The Laurentide Company will be in a position to sell considerable surplus power and so to extend the fields of the industry in the St. Lawrence Valley.

A CATALOG WORTH HAVING.

A most comprehensive catalog telling in an interesting way the mission of the Recording Thermometer in the modern industrial plant and its great value in promoting vigilance on the part of operators in charge of processes in which the maintenance of a certain temperature is important to the quality of a product or the efficiency of the process enables intelligent supervision of these processes from the desk of the Manager, Superintendent, or the party in charge—the man whose duty it is to attain maximum efficiency and production with minimum expense from the plant under his management. The catalog is profusely illustrated showing the numerous types of "Columbia" Recording Thermometers. The many new features of the "Columbia" outlined will be found to be departures in Recording Thermometers construction. The Removable, Adjustable and Compensated Recording Pen Arm is an improvement of great value. It makes chart changing easy and eliminates the possibility of errors to due to temperature changes at the Recorders case.

The new patented fume and moisture proof insulation for the steel connecting tubing of the "Columbia" is worthy of note. It is a perfectly insulated tubing, practically indestructible and yet flexible. The "Day and Night" border chart which is winning so much popularity commands its share of interest. The catalog is certainly worth having, especially by those seeking to attain efficient and economical management. A copy may be had by request to The Schaeffer and Budenberg Manufacturing Co., Brooklyn, N. Y.

NEW CANADIAN OFFICE.

On the first of July, Joseph H. Wallace & Company, Industrial Engineers, Temple Court Building, New York, Salisbury House, London, E. C., are opening a Canadian office at 904 New Birks Building, Montreal. The new office will enable them to handle to the very best advantage engineering work for the Canadian pulp and paper mills. The office will be in charge of two members of the firm, Joseph Perry and T. R. H. Murphy, who for a number of years have been in close touch with work in Canada and with Canadian manufacturers.

"SAFETY FIRST"

By J. F. H. WYSE

Organizer and Engineer, Ontario Safety League

Before Convention of Canadian Electrical Association.

The term "Safety First," is said to have been originated by the United States Government, in a nationwide movement, during 1908, to reduce accidents in coal and metal mines. It is estimated that there were, during the years 1908-9-10 and 11, on account of this campaign, 51,400 lives saved.

"Safety First" is the slogan under which many Safety Leagues, Safety Committees and Associations of today are conducting vigorous campaigns for the prevention of accidents.

The movement is almost universal (at least as far as civilized countries are concerned). Its objects are good—the saving of life and limb.

Historical.—For centuries the ingenuity of man has sought out many inventions to perfect machines for almost every conceivable purpose; however, neglecting the greater care and conservation of the finest machine of all, namely, the human being. To produce the finished article, the laborer, the mechanic, the artisan, the engineer—in fact, all the human element used in factories of every description—had been, up to recently, seriously neglected. The wonderful human machine and its care had been held cheaper than the mere mechanical device.

We have to give the little country of Holland the credit for taking the initiative in accident prevention, in a crusade for human safety and for setting the whole world an example in this laudable work. In the year 1893 a few enthusiasts rented a small dwelling, and secured and placed therein some photographs, models, drawings and actual machines, with devices and attachments, showing their dangers and how to avoid these dangers in operation. At the present time this organization occupies a new and commodious building in Amsterdam, opposite the Rijks Museum.

Berlin was the next to fall in line, and in 1903 established a Museum of Safety Appliances, which stimulated the public interest. Such success was attained by these museums that the Government soon took them over and looked after their maintenance and enlargement. Today this Berlin Museum is said to be the finest of its kind in the world.

Shortly afterwards Germany established similar museums in Munich and Dresden, and today Germany is said to have solved the great problem of public safety. What Germany has done, we have yet to accomplish.

The American Museum of Safety, with its head office in New York City, established in 1908, is a vigorous child of this Dutch and German parentage. There are now at the following places, some twenty-two, or more, of these institutes for the promotion of Safety and Hygiene—Amsterdam, Berlin, Barcelona, Brussels, Budapest, Copenhagen, Dresden, Frankfort-on-the-Main, Gratz, Helsingfors, London, Milan, Moscow, St. Petersburg, Stockholm, Vienna, Wurzburg, Zurich, Paris (two), New York City, and, last but not least, Montreal.

Industrial.—The class of industrial accident prevention is divided and sub-divided as follows:—

1. General—Boilers, Containers, Steam Piping, Power Machines, Transmission, Electricity, Elevators and

Hoists, Personal Equipment of Workmen, Miscellaneous.

2. Particular—Mining, Quarrying and Excavation, Blast Furnace and Foundry, Woodcutting, Stones and Clays, Paper and Printing, Agriculture, Transportation by Land, Transportation by Water, Metal Working, Building Trades, Chemical Industries, Textiles and Clothing, Foodstuffs, Building Trades, First Aid to the Injured.

In addition to these groups, the operations of the institutes are devoted to Industrial Hygiene, covering apparatus and instruments for the testing of air, light and water, miscellaneous, ventilation, infectious diseases, tuberculosis, water closets and lavatories, exposure of substances detrimental to health, lighting, exhaust for dust and gasses, baths, dining rooms, clothing and the personal equipment of the worker.

Also Mutuality of Social Hygiene, covering, improved dwellings, service annuities, foodstuffs, miscellaneous.

In the industrials of Europe it is conservatively estimated that the "Safety First" movement has reduced accidents at least 50 per cent, and the work has done with the firm belief that "Every life saved is a national asset."

Expenses caused by accident are a burden to the taxpayer, and saving along these lines is a "balance on the right side of the ledger."

Dr. Zacher, director of the German Imperial Bureau of Statistics, makes the following statement: "One billion marks (nearly \$250,000,000) is saved in wage-earning efficiency annually in Germany through our sanatoria, museums of safety, convalescent homes and other forms of social insurance, by which we safeguard the lives and limbs of our workmen, and prevent the cause and effects of disease, which would lessen their economical efficiency. Some of our industrials and manufacturers are waking up to the fact that prevention of accidents pays, and that it is far cheaper and more economical than compensation."

Dr. Tolman, Director of the American Museum of Safety, and author of a volume entitled "Safety," to which I am indebted for much information contained herein, says:—"A recent case brought to light the fact of how one manufacturer, after the inspector's report had been received, left a floor pit uncovered. Shortly afterwards a workman fell into it, and received \$15,000 damages. Literally, a wooden hand rail at the top of this precipice would have cost \$5; the ambulance at the bottom cost \$15,000."

In Germany, every employer must belong to the trade association of his business. He pays to the association an accident premium, which is an insurance of his workmen's safety, and he, the German employer, knows after twenty-five years experience, that any accident is sure to be thoroughly investigated, and the first question asked will be, "Was there a proper safeguard provided?"

The Industrial Safety Campaign has brought about improved illumination and safety in miners' lamps; the safeguarding of emery wheels, buzz planers, grinding wheels, circular saws, band saws, woodworking tools, lathes, cranes, cars used in shops, are lamps, scaffolds, manholes, steam boilers and valves, and has resulted in safeguarding railway yards, shops and locomotives. One large plant has the following sign:—

"TO MEN SEEKING EMPLOYMENT."

"Unless you are willing to be careful to avoid injury to yourself and fellow workmen, do not ask for em-

ployment. We do not want careless men in our employ."

The United States Steel Corporation employs over two hundred thousand men. Immediately after the year 1906 they started a "Safety First" campaign for the prevention of accidents, and have saved, since then, nine thousand lives and serious injuries, making a total reduction of 46 per cent. This answers the question, "Is it worth while?"

Traffic Many railways and street railways in the United States and Canada have organized a safety movement to conserve, not only the public but their own employees. The results have been so successful that it is said, "Once a 'Safety First' movement is started, it is never abandoned, but goes on increasing its work and widening its scope." One of these railroads saved one hundred and seventeen lives and seventy five hundred injuries in a campaign of some forty months; and a street railway, by letters to automobile owners and teamsters, reduced its street traffic accidents in one month about 40 per cent.

Central Electrical Stations and Line Operation—There is not much danger around the Central Station if proper precautions are used, but there should be rules to govern the handling of all lines, wires, cut-outs and switches, and these rules should be strictly observed. A good rule for the operator in the station is to cut-out or dead-end a line or section on the order of anyone, but never to cut-in again without orders from the head of the crew or the personal order of the one who called for the cut-out.

The engines, if any are used, should be completely guarded with railings, and all belts should be carefully protected from possible contact.

Every person who handles high voltage wires at any time should be instructed as to the danger, and shown how to break a circuit without endangering his own life, and also should be taught the "Schaefer" method of resuscitation.

For pulling fuses on high tension wires, or replacing same, sticks should be provided with hooks on the end, to ensure a good grip, and rubber gloves should be used always.

When fuses are to be pulled in cellar, or tunnel, or any other place, it is better to have at least two men around. One man should never go into a dangerous place without notifying some fellow workman. On dynamos and generators rubber mats should be placed around the base for the operator to stand upon while oiling or adjusting the machine.

Where the operator steps upon the base to examine or adjust the brushes or other parts, there should be a secure railing between him and the revolving parts of the machine, and the base should be filled so as to prevent his slipping and getting inside the frame.

Where there are dangerous wires exposed in cellars or tunnels that are forbidden as passages, it is a good scheme to cover the floor with a light sprinkling of whitewash every morning. This will show the foot-prints of any person who disobeys the orders. Such passages are sometimes very handry short-cuts, and the men will slip through and may get shocked.

A Pulmotor should be part of the equipment of every station and should be kept always ready for use, and the station employees should be thoroughly and practically trained in its use.

Every wire, whether insulated or not, should be considered as dangerous. Absolutely no credit should be given to outside insulation as an accident preventive.

This has too often proved "a delusion and a snare." It would be an excellent thing for the Central Station to run, from time to time, in the daily papers, advertisements dealing with the "Dangers of Overhead Wires and How to Avoid Them."

In Germany 34 per cent. of all reported accidents in 26 years were caused by ladders. Make sure that all ladders used inside and outside the station, or on the line, are provided with safety points or ladder shoes.

General. Based upon accident prevention work in the United States, and what they have accomplished, similar work in Canada would effect a vast economical and social saving.

Money is being freely spent by our Governments on Forests, Game and Fisheries, while our wage-earners, when hurt through avoidable accidents, become a burden upon the taxpayers and objects of charity. Would not some of the public money spent to prevent these accidents be a good investment? Educational and legal prevention of accidents and disease by sanitation is better and more economical than the cost thereof after accidents have occurred. In other words, "An ounce of prevention is worth a pound of compensation."

It becomes more easy to obey rules for safety when their importance and wisdom is realized than if they are to be regarded as mere rules. We must wake up here in Canada, as they have done in some other parts of the world, to the subject of conservation of human life and limb.

There is nothing in the "Safety First" Movement of a political or partisan nature. Its aims are to invite all creeds, parties and interests in a universal endeavor to safeguard life and limb. The work is in no sense revolutionary, but proposes to accomplish its objects by sane and conservative methods; to make suggestions, to give warnings, to get the co-operation of all the people all the time, and to secure their moral and financial support as an investment that has paid, and will still continue to pay.

The remedies are to educate the public to make Safety their first consideration. We teach them:—

Through the columns of the daily papers and periodicals.

By letters and cards of instruction to autoists and teamsters.

By getting the ministers to preach "Safety First" sermons.

By posters and stencilled signs in conspicuous places.

By popular lectures, and by the distribution of circulars, blotters, and "Safety First" buttons, and by securing the best traffic legislation and its enforcement.

Lectures and moving pictures to school children are one of the best ways to get at the public, and by the children the idea is taken practically into all our homes, the parents' interest is thereby awakened, and the objects of "Safety First" secured.

REMOVING ROSIN FROM UNBLEACHED PULP.

A patent has been obtained in Germany on a process for removing rosin from unbleached sulphite pulp. After the liquor has been blown off, the pulp is washed and then mixed with suspension of tale or asbestos dust, or a mixture of both, preferably together with some petroleum, and heated in the boiler under a low pressure, after which it is centrifuged and washed.

Dam Breaks on Upper Ottawa

Ottawa, Ont., June 27.

A serious accident has occurred to the Dominion Government dam built at the foot of Lake Temiskaming for conservation purposes, and as a result the level of the Ottawa River has temporarily risen below the break, while that of the lakes above have gone down from 6 to 10 feet. Every lumber and pulp industry along the Ottawa River will be affected.

About 120 feet of the big dam at the point referred to has gone out, through some cause, which has as yet not been found. This falling away includes three piers on the Quebec side of the dam in the deepest part of the channel, about 60 feet of sluice gates and sixty feet of piers. The accident occurred as a result of the undermining of a pier underneath the "apron" of the big structure, and took place without warning. A large volume of water was immediately released, which flowed down the Ottawa and considerably down its level for the time being. As an immediate result, also the water fell in Lake Temiskaming, which is now between 6 and 10 feet lower than before. It is feared that navigation on the lake will suffer in consequence. A new wharf built at Ville Marie, it is expected, will be left dry, as will be another new wharf at Paradise Bay.

The dam went out on Sunday, the 14th. Stored in the reserve of water near the dam at the time the break occurred was a large supply of logs belonging to different Ottawa Valley companies, which have been held up by the lowness of the water. Lumbermen, in fact, had been complaining for some time past there was not enough water in the river to float their timber and some of them, including Gilmour & Houghson and the W. C. Edwards Company of Ottawa, had been promising to close down their mills unless a larger supply were obtained. To these people as well as to other lumber and paper firms with logs on the river, the break came as a rather welcome occurrence, since it supplied a temporary head sufficient to meet their needs. This will be the case for some time until sufficient progress has been made with the repairing of the dam to hold the outflow back.

The Temiskaming dam to which the accident occurred was built five years ago and this is the second break which has taken place. About two years ago the first incident of the kind occurred though the structure has always given the engineers more or less trouble. The dam was commenced under the former Government and continued under the present one. It has been claimed in some quarters that the location chosen for it was unsuitable since quicksands existed thereon. The Ontario side of the dam was let by contract while the Quebec side was undertaken by the Government.

The big structure is divided into two parts, one in the Ontario channel and the other in the Quebec channel and each is about 400 feet long. There are 16 twenty-foot sluices on one side and 14 on the other while the piers are about 30 feet high. The cost of construction was \$300,000 and an unofficial estimate of the damage done and the sum necessary for repair work does not place it much below \$40,000.

Mr. C. R. Coutlee, in charge of conservation and regulation work on the Ottawa River, was seen by your correspondent, and stated that it was expected the dam could be repaired by the end of July. He pointed out that it was rather the bottom which had washed

out than the dam itself which had broken. As for the results to lumbering operations, Mr. Coutlee stated that while the break would temporarily benefit them, it would work to their detriment in September and the fall months, when as a rule there is sufficient head stored behind the dams at Lake Temiskaming and Kippewa to maintain the level. Mr. Coutlee also stated that this was absolutely a record year in the Ottawa, and that unless there was heavy rains in July and August the situation would be more serious than any other, which power users on the river have faced in past years. —MAC.

VETERAN PAPER MAKER ON VACATION.

Mr. Robt. Aitken resigned his position as Superintendent of the Canada Paper Co.'s book and writing paper mill, at Windsor Mills on June 15th. After a service of twenty-four years, fourteen years as beater



MR. ROBT. AITKEN

engineer in the bag, manila, fibres, water finish and news print mill, and two years as Superintendent of the same mill, after which he was promoted to be Superintendent of their fine book and writing mill, with two machines, one white and colored bonds, fine arts and featherweights, the other on colored posters and covers, mottled fibres, water finished fibres and kraft. This latter position was held by him with great success for eight years, up to the time of his resignation.

With his wife and daughter he will sail on the Allan S. S. Grampian on July 4th for Glasgow and will take a well earned rest for a few months before returning to Canada. He intends visiting many of the principal paper mills in Scotland and England to see if he can gain any hints that may be useful to him on his return to Canada, especially in the manufacture of blottings and featherweights, and the use of stone beater rolls on ground wood and other fibres.

Canadian Forestry Convention

Mr. James Lawler, Secretary of the Canadian Forestry Association, is actively engaged in forwarding arrangements for the convention to be held in Halifax on September 1-4. A recent report states:—

"From those who have already signified their intention of attending the Convention at Halifax, it is evident it is going to be one of the best yet held. A number are going to make it a holiday trip, on which they will take their ladies, as well as an occasion to help along the cause of forest conservation. The Secretary is shortly making a brief trip to Nova Scotia to make preliminary arrangements.

Railway arrangements are on the Standard Certificate Plan. By this delegates purchase one-way first class tickets to Halifax and secure a certificate from the railway agent selling the ticket. These certificates will be signed by the Secretary at the Halifax Convention, and when thus signed will be honored for return tickets to the starting point.

From and including Fort William, Ontario, eastward tickets will be on sale at all railway stations in Canada Aug. 28 to Sept. 3, inclusive, and properly validated certificates will be honored at Halifax for tickets for the return journey up to and including September 8.

In Western Canadian territory, (namely, west of Fort William to the western boundary of Alberta), the dates of sale will be August 24 to 27, inclusive. Properly validated certificates will be honored for return tickets at Halifax up to and including September 19 for tickets back to starting point.

From British Columbia points the dates of sale will be August 22 to 26, inclusive. Properly validated

certificates for return tickets will be honored at Halifax up to and including September 19.

These dates for British Columbia and Western Canada points will accommodate those desiring to travel by steamer across the Great Lakes. The usual arbitrariness will apply for passengers desiring to use the lake route.

Delegates are requested to acquaint themselves thoroughly with these dates and rules, as failure to observe them will render it impossible for them to get the reduced rate. The Secretary is anxious to get the names of those who expect to attend, and will gladly give information on any point not clear. His address is Journal Building, Ottawa.

TRADE INQUIRIES.

There have been received by the Department of Trade and Commerce, the following inquiries relating to Canadian trade. The names of the firms making these inquiries, with their addresses, can be obtained only by those especially interested in the respective commodities upon application to: "The Inquiries Branch, The Department of Trade and Commerce, Ottawa."

496. **Kraft wrapping paper.**—A London firm have an important inquiry for Kraft wrapping paper for shipment to New Zealand, and invites samples and quotations from Canadian manufacturers who can offer supplies for prompt shipment.

523. **Paper wrapping.**—Samples and prices are asked for by a South African importer.

524. **Paper bags.**—A South African importer asks for samples and prices on Canadian paper bags.

Correspondents are requested to mention the Reference number of the inquiry.

NEW ONTARIO PULPWOOD SHIPMENTS SHOWED GREAT FALLING OFF IN MAY.

Cobalt, Ont., June 17.—There is a great falling off in the number of cars, and the number of cords of pulpwood shipped during May of this year compared with the May of last year. This is probably due to the fact that the season is so much more favorable for the working of the land, and that the greater clearances require more attention.

Shipping Point.	Destination.	1913. cars.	1913. cars.	1914. cars.	1914. cars.
Latchford	Niagara Falls.	42	630	67	972
Gillies Depot	Sturgeon Falls.	..	...	2	24
North Cobalt	Latchford.	..	...	1	12
Haileybury	Johnsonburg.	..	...	1	14
New Liskeard	Johnsonburg.	..	...	3	38
Uno Park	Thorold.	1	12	...	...
Earlton	Sturgeon Falls.	2	24	...	...
Earlton	Thorold.	2	25	...	...
Earlton	Merritton.	2	25	...	...
Earlton	Latchford.	33	400	2	261½
Earlton	Port Huron.	..	...	2	25½
Heaslip	Latchford.	5	66	...	...
Englehart	Thorold.	..	...	1	12
Englehart	Johnsonburg.	..	...	8	111
Charlton	Thorold.	4	54¼	1	12
Charlton	Latchford.	..	...	4	51
Matheson	Sturgeon Falls.	..	...	3	40
Matheson	Latchford.	..	...	12	151
Porquis Jet.	Sturgeon Falls.	2	31	1	10
Porquis Jet.	Latchford.	7	96	2	27
Cochrane	Thorold.	26	451½	...	...
Cochrane	Latchford.	5	75½	1	13
Total		131	1890¼	112	1500½

Convenient Method of Handling Chemical Solution in Quantity

C. E. Phelps, M.E., in "Metallurgical and Chemical Engineering."

When acids and other chemical solutions of a corrosive nature must be lifted or conveyed from one place to another, the relative advantages of different methods of accomplishing the desired result cannot be decided on the question of initial or operating costs alone, for the service may be so severe on certain types of apparatus as to render them practically useless in a short time. Frequent delays for repairing may also occasion great losses due to the stoppage of manufacturing processes. Ordinary reciprocating and rotary pumps are often out of the question, even when constructed of special material of a non-corrodible nature.

A device known as a montejus, which is operated by either air or steam pressure, has been used to some extent for this purpose and is fairly satisfactory; but it is open to the objection that it has valves, floats and other

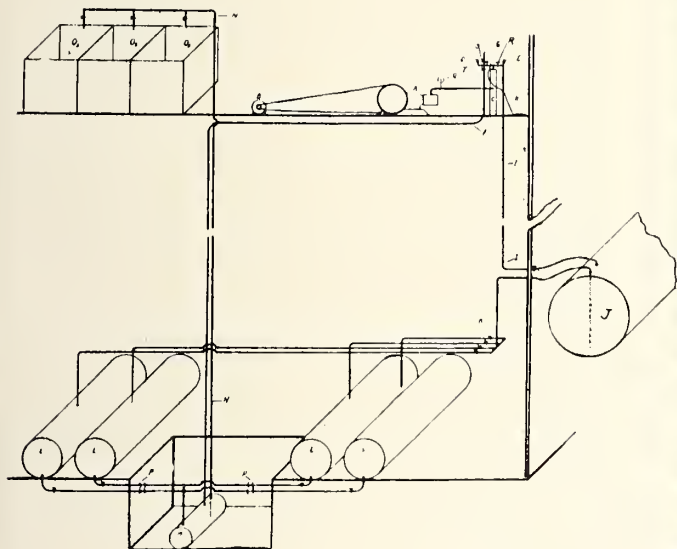


Fig. 1.

moving parts in contact with the fluid. Other devices, using air or steam pressure, employ either the injector or siphon principle for their operation with more or less success, depending upon the requirements, but they, too, have certain limitations in practical use.

For handling chemical fluids in large quantities the method illustrated herewith has certain advantages which will be apparent from the description. The system illustrated in Fig. 1 is in use in a large Massachusetts textile mill, for raising heavy commercial oil of vitriol to bleaching vats on the third floor of a building. Compressed air is used, not only for this purpose, but also to empty the acid from the tank cars which are brought alongside of the building. The engineers in charge of this plant consider that the method which they have adopted is admirably adapted for its purpose.

Referring to the diagram, O_1 , O_2 , O_3 are lead-lined bleaching vats; they are partially filled with pure water, after which 100 gal. of the concentrated sulphuric acid is raised and added slowly to the water, the contents being stirred while the acid is being added;

then a small quantity of hydrochloric acid is added by hand from a carboy, after which the bleaching solution is ready for use.

Located near the vats is an air compressor A driven by a $2\frac{1}{2}$ -hp belted motor B. The compressor cylinder has a displacement of 15 cu. ft. of free air per minute and operates normally at 40 lb per square inch air pressure. The compressor, gauge, receiver and controlling valves are shown in the photographic view, Fig. 2.

The compressor discharges into a length of pipe C of large diameter, which acts as a receiver to steady the pressure in the line. Gauge Q indicates the air pressure in the line. Two air lines, I and F lead from the receiver. By closing all valves on the left of the

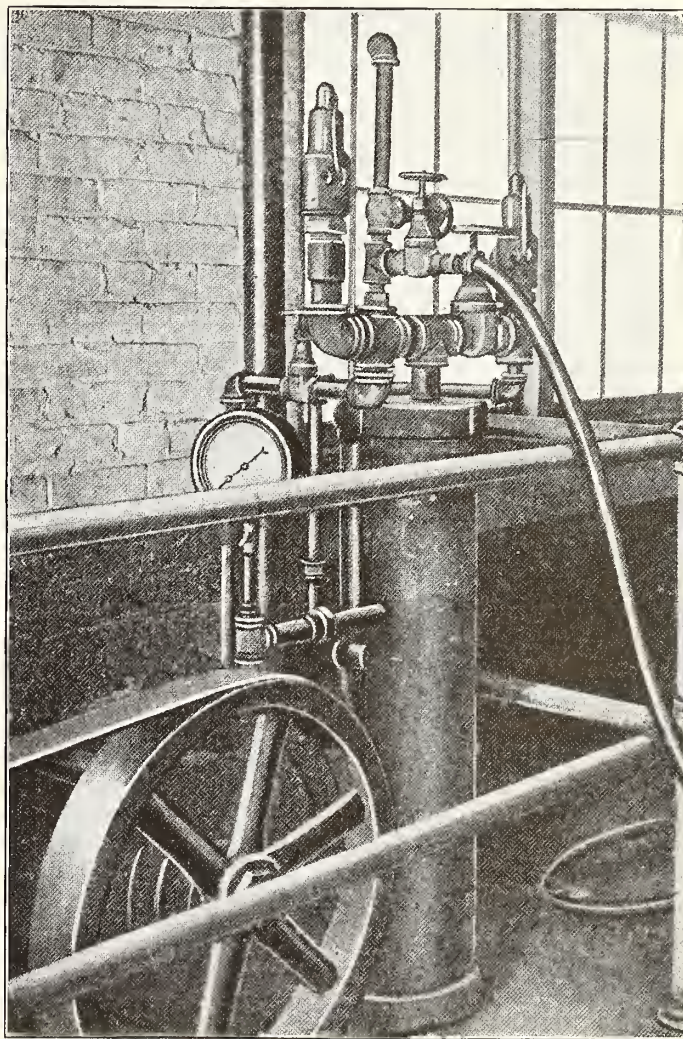


Fig. 2.

receiver outlet and opening valve R, pressure is put on pipe line I. The latter line leads to a connection whereby air pressure can be put on the tank of an acid car J. Safety valve E is set for 15 lb per square inch, so no pressure in excess of this amount can be put on the car tank. The car tank's outlet is coupled with pipe K leading from the outside of the building to four heavy iron reservoir tanks L in the basement of the mill. Each of the tanks L has a capacity of 3,500 gal. and is provided with air vents. With an air pressure of 15 lb., it requires about two hours to empty the car, capacity of which is usually about 5,000 gal.

Pipes lead from the bottom of the reservoir tanks to the top of a 100-gal. iron supply tank M placed a few feet below. In each of these connecting pipes is a check valve P to prevent the acid from returning to the large tanks. Leading from the top of the small tank is the air pipe F. Normally this serves as a vent, allowing the acid to flow into the small tank and fill it. When a charge of acid is wanted, this vent is closed by a valve S near its outlet G and air pressure is put on this line by opening valve T. The acid immediately begins to flow from the bottom of the 100-gal. tank up pipe N to the bleaching vat, a height of about 40 feet.

Correspondence

AMUSEMENTS FOR PAPER MILL TOWNSHIPS.

The Editor, Pulp and Paper Magazine:—

Canadian paper makers have at least one trouble, which those in more thickly populated countries do not feel so acutely; that is the difficulty, not so much in securing, but in retaining good help. Many of the mills are considerable distances from any large centres of population, where recreation and entertainments to suit all tastes can not always be enjoyed. The tendency of the present generation of paper mill workers is to require more variety and amusement than their fathers and grandfathers, before them, ever thought of, or wanted. It is undeniable that it is better for both mill owners and workers that as soon as they find that they can get on well together, that there should be as few changes as possible. Because each worker, of whatever grade, if he remains at one mill for a time, gets to thoroughly understand the working of his department, the temperament of his mates and bosses, and by the time he has got so far, he is pretty certain to identify himself with that particular mill, and take a very real interest in its success.

In Scotland and in England, where most of the mills are some distance from towns, many mill owners have for some time been endeavoring to make things more interesting in the home village for their employees. Some have been very successful in this way, and some have not; all depends on the way the business is handled. It very often happens that a certain amusement is started, goes splendidly for a year or two, then interest slackens off and finally expires. Something fresh should then be ready to come to the front.

Amusements may be divided into indoor and outdoor. Taking indoor first, we may enumerate a few: A lending library, combined with a reading room, billiards, checkers, chess, skittles, various card games, vocal and instrumental music, recitations, dances, lectures, etc., etc. For outdoor, there is rifle shooting, football, bowls, boating, picnicking, and all the winter sports. So there is plenty to choose from in both summer and winter amusements.

There are different ways of organizing these amusements, but it is generally conceded that there is only one way of doing it successfully, and that is jointly, by employer and employed for mutual benefit. The employer will find it to his interest to invest a certain amount of capital in finding the necessary recreation building and land, but when started, if the business is to be run satisfactorily, and everybody interested in it, it must be run on self-supporting lines, by a committee representing all grades of employees. The duty of this committee, in addition to finding amusements

for the male workers, would be also to do the same for the wives, grown-up daughters and the children.

Doubtless quite a number of your readers have spent one or more winters at some of the more inaccessible mills, and if the truth was told, many of them found it so dull, that they promptly began to feel unsettled and sought out another job, where they expected to find some doing in the amusement line. In summer things are not so bad, for people can get about, and are not compelled to keep under cover most of the time, but that the winter is somewhat tedious we cannot help admitting. Still, if the employees of a paper mill find it dull they have largely themselves to blame.

Few, if any, employers would decline to assist in helping to get up recreations for their people, for they are quite alive to the fact that it is better for the business and for everyone concerned that the continual changing of workers, should be avoided by all reasonable means, as no one makes money out of it except the railway companies, and nine times out of ten both employer and employed are out of pocket.

To start an amusement committee club or whatever it may be called, the employees should fully discuss the matter and then approach the Big Boss with moderate and reasonable suggestions to start with, and let the variety and extent of the entertainments increase, as the committee gain experience and the population show appreciation.

There ought to be about one entertainment every week during the winter months and an extra one thrown in every now and then.

It takes really very little trouble to get up a series of concerts, dances, an occasional popular lecture, a social evening now and then, special children's entertainments, and so on. There is always plenty of talent for amusing among the employees of any paper mill, although at first it generally takes some trouble to find it, but the more entertainments there are, the more easy it becomes to discover un-suspected talents.

It is quite true that "all work and no play makes Jack a dull boy," but now-a-days the shorter hours worked at many paper mills dispose of the "all work" theory. Then we naturally ask ourselves, if Jack is a dull boy, why is it? He has plenty time for both sleep and play.

The trouble we fear is that many Jacks have never learned how to amuse either themselves or their friends. Hence the object of this article is to try and promote the more general use of intelligent and varied amusements and to try and obviate a lot of useless hanging round or in plain words loafing, during the time that should be devoted both to mental and physical development.

—ALEX ANNANDALE.

UNITED STATES DEPARTMENT OF AGRICULTURE AND KRAFT PAPERS.

Editor, Pulp and Paper Magazine:—

It would appear from various bulletins issued by the United States Dept. of Agriculture that they are making very strenuous efforts to make the public believe in the superiority of longleaf yellow pine as a paper making material, and incidently in this way to build up the South as a paper making centre. This is a very praiseworthy object on the part of the Department of Agriculture, and one in which every broad-minded American wishes them success, but one cannot help thinking that the best interests of the South would be served by not painting too rosy a picture of the suit-

ability of Southern woods for the manufacture of Kraft Paper.

I have before me Bulletin No. 72 of the United States Dept. of Agriculture, Forest Service, and certainly think a more thorough investigation should have been made before such statements as those contained therein are made public; because, owing to the excellent work which has been done by the Dept. of Agriculture the public generally place absolute confidence in their bulletins, and in this way capitalists and investors who are not thoroughly familiar with the paper industry may be led into unfortunate investments.

On the strength of about a dozen tests made on quite a small scale, and on wood from only two localities the investigator says in conclusion: "That Kraft Papers can be made from longleaf pine equal or superior in quality to the imported and domestic Kraft Papers now on the market."

This is truly a remarkable statement, because it is not borne out by commercial facts; one Southern mill trying to make Kraft Papers by the Sulphate Process has had to close down permanently, and most of the Southern Kraft Paper now on the market sells from 10¢ to 50¢ less per hundred pounds than foreign Kraft or that made from Northern woods. Neither is this statement about the superiority of Kraft Paper made from longleaf pine proved by the results as reported in the bulletin; the best strength factor (average of five pop tests in pounds per square inch divided by weight per ream 24 x 36—500) obtains by the investigator, table 1 is 0.93, the lowest 0.50, the other values of course ranging between these two. The strength factor demanded by the trade for a No. 1 Kraft Paper is at least 1.0, while the writer has recently tested samples of domestic Kraft made from Wisconsin woods, having strength factors ranging from 1.00 to 1.20.

In the bulletin nothing is said concerning the breaking length of papers obtained from longleaf pine, the writer has tested dozens of samples of paper made from Southern Pine on the Schopper machine, and has yet to meet one with a breaking length of 6,000 meters, the German standard for No. 1 Kraft. While domestic Krafts made from Northern woods (of which hundreds of samples have been tested) rarely go below this standard, the average having a breaking length of about 6,800 meters, or a little higher.

It would certainly be for the best interests of the South for the Dept. of Agriculture to state the facts as they are, namely that Longleaf Yellow Pine makes a good No. 2 Kraft Paper, and is also an excellent material for making box board, but at present it has to be demonstrated both commercially and experimentally that a good No. 1 Kraft can be made from it.

WALTER CLIFFORD,

Chemist to Wausau Sulphate Fibre Co., Mosville, Wisconsin.

ROPE AS STRONG AS STEEL.

Of the flexible ropes suitable for power transmission, a manila rope is just as strong as a solid steel bar, weight for weight, though only about 11½ per cent. as strong per equal cross-section. Leather, on the other hand, is only about 5 per cent. as strong as a steel bar of equal cross-section and less than 40 per cent. as strong per equal weight of material.

Records show that rope manufactured from the fibre of palms was used in Egypt long before the days of

Christianity. Such ropes were found in the tombs of Beni-Hassan (3000 B. C.) and on the walls of these same tombs are illustrations depicting the preparation of hemp. Carvings found in tombs in Thebes represent the process of making rope from thongs of leather, about 1600 B. C., and Assyrian sculptures of about 50 years later show gigantic hauling operations performed with rope. These records are of particular interest as indicative of the steps through which rope manufacture passed in the early ages.

The relative efficiency of manila rope and leather belting for the transmission of power is not directly proportional to their respective strengths, however, as the internal construction of a hemp rope and a strip of leather differ greatly and very differently by wear. Manila fibres from which the rope is manufactured, are usually from 8 to 10 feet long, are composed of elongated cells that possess great strength longitudinally, but are comparatively weak transversely. Leather, on the other hand, is about equally strong in any direction so that the wear on such a belt is mostly external. In a manila rope the wear is largely internal, the elongated fibre cells being crushed together when passing around a sheave and breaking up into short pieces. A worn-out manila rope, as far as its strength is concerned, may have the outward appearance of an excellent rope while internally in construction is but a mass of short, broken particles. The allowable working stress of a good leather belt is customarily taken as 320 pounds per square inch, or about one-tenth its tensile strength. In the course of a year or so a manila rope will lose about 50 per cent. of its original strength, after which the weakening becomes more gradual. Under such conditions it is safe to figure on an allowable working stress of about 288 pounds per square inch or 1-32d its tensile strength.—Power Magazine.

ABITIBI REGION RICH.

After a tour of inspection in the Abitibi regions in North Western Quebec with a company of Cabinet members and Government officials Sir. Lomer Gouin, Premier of Quebec returned to Montreal with most enthusiastic reports of the region. On either side of the National Transcontinental there is an agricultural area which is equal in quality to many of the finest lands in Western Canada and this will be developed with great impetus to the pulp industry from the clearing of land for farms and the selling of the pulp wood is an undoubted probability in his mind. The establishment of pulp and paper industries even in this far north country is well within the range of possibility in the near future. The Premier was accompanied on his visit by Mr. G. C. Piche, Chief of the Forestry Division of the Department of Lands and Forest. Mr. Piche paid particular attention to the forest and pulp conditions and will be in a position to make a report as soon as the information has gone through the proper official circles.

PAPER AND PULP IN RUSSIA.

There are in Russia eighty joint stock companies engaged in the manufacture of paper, with a collective capital of 55,000,000 roubles (\$28,325,000). The manufacture of paper from woodpulp is on the increase, while the manufacture of rag paper is falling off.

Ottawa Notes

Ottawa, One., June 25.—A rather surprising but healthy condition in the Canadian paper trade is shown by preliminary figures for the fiscal year ending March 31 last, issued by the Trade and Commerce Department last week. These figures, which are of course not given in detail, indicate that in spite of the financial stringency which has prevailed during the past year, exports of Canadian pulp and paper products in 1914 were almost twice as great as in the fiscal year of 1913. On the other hand, imports have slightly decreased.

Paper of all kinds exported by Canada in 1914 totalled \$12,686,896 or almost double that of the previous year, \$6,327,774. The greater part of this amount, or paper valued at \$10,566,359, was sent to the United States, while \$510,818 went to Great Britain. The imports in 1914 were \$8,043,368, of which paper valued at \$5,423,037 was imported from the United States and \$1,687,839 from the British Isles. This is a slight decrease since 1913, for which year the figures were \$8,347,381.

Ritchie Brothers, of Aylmer, Que., whose large saw-mills were totally destroyed by fire some weeks ago, with a loss of about \$75,000, have decided to re-build. Mr. Ritchie has purchased a saw-mill from McKay Brothers, at Eardley, and this will be brought down. A large gang of men are now at work clearing away the debris to allow the work of re-erection to commence at once.

Before Parliament adjourned over a week ago an interesting discussion took place over the application of the North Shore Power, Railway and Navigation Company to change its name to the Gulf Pulp and Paper Company. It was explained that this company, which was originally incorporated by a private bill, carries on business in Quebec, where it employs about 800 men, and that it now wished to extend its operations outside of Quebec.

Objection was raised by some members to the fact that the word "Limited" was not being added to the name of the company, it being held that it was customary for commercial companies to do so. Hon. Dr. Reid, however, pointed out that the E. B. Eddy Company and the Grand Falls Water Power and Boom Companies had been incorporated without the word "Limited," and Mr. Claude Macdonell, acting chairman of the Private Bills Committee, clinched the argument by stating it would be very unfortunate if the bill were thrown out, because the president of the company, who had been before the committee, had stated he had an investment of \$5,000,000, and that for five months in the year operations were held up because of their not being able to make shipments after the close of navigation. The bill was finally allowed to go through.

The William Cauldwell Paper Company, Ltd., has also obtained authority at Ottawa during the past week to change its name to the Beveridge Paper Company, Ltd. A new company has been incorporated in the Chaleurs Bay Pulp & Paper Company, Ltd., which will have its head office in Sherbrooke, Que., and will be capitalized at \$100,000.

The pulp and paper trade will await with interest the arrival in Canada on August 3 of the Dominions Royal Commission, the Imperial trade body which is touring the British Empire and which will go across Canada during August and September. Every branch of Canadian industry and commerce, including the pa-

per trade, will be investigated, and already much information from members of the trade has been secured by Mr. F. C. T. O'Hara, deputy minister of Trade and Commerce, who is the Canadian representative of the Commission. The Commission will visit Montreal, where three days will be spent, and will also hold sittings in all important Canadian cities. Among subjects of general interest with which it will deal, the most important will be that of ocean freight rates.

"The numerous and in some cases serious forest fires which occurred throughout Eastern Canada during May," are used by Mr. Clyde Leavitt, chief forester of the Commission of Conservation, to point the moral that Canadian forest fire protection is still inadequate. In an interview, Mr. Leavitt stated that, "These fires prove that, while much is being done by the various provincial governments and other agencies in forest fire protection, the provision is still inadequate in case of an extended drought. The strict enforcement of the permit system for the burning of settlers' slash would very materially reduce the number of fires. It is, however, hardly to be expected that, with the vast areas of forest lands and the relatively small population to bear the burden, adequate fire protection can be secured on cut-over forest lands so long as practically no requirements are imposed upon lumbermen as to the disposal of inflammable debris resulting from woods operations. The policy adopted by the British Columbia Government in this matter is the most progressive of any in Canada."

An accident which luckily was unattended with injury to any body occurred at the mills of the J. R. Booth Company at the Chaudiere early last Sunday morning when a whole section of the platform in front of the saw-mill collapsed and fell, carrying with it several rigs and small buildings. If the collapse had occurred on a week-day, some of the large number employed in the mills would probably have lost their lives, but fortunately no one was working in the vicinity.

BROWN WOOD PULP.

Among the new methods recently proposed for brown pulp without resorting to the grinding process, which requires great power, the roller crushing process of Rudolf Kron (Austrian Patent 54,166) deserves special mention. It is well known that the ordinary mechanical process with steamed wood consists in a combined grinding and crushing action entailing much loss of power by friction. It also makes too much waste in the shape of very small fragments.

The Kron process consists in passing the steamed wood between rollers lying across the grain, and it seems likely to replace the older methods as effectually as the roller has replaced the millstone in grinding corn. The rollers reduce the wood to fibres which have lost all their hardness and stiffness, so that they will make good pulp even out of the hardest woods.

The necessary succession of roller pairs is contained in a machine called the softener. The rollers are made of the best chilled cast iron, and the rollers of each pair are at adjustable distances from each other. The material is fed continuously to the uppermost pair, and leaves the lowest pair ready for the pug mill, whence it goes direct into stirring vats, and is then sorted and refined exactly like ordinary mechanical pulp, and passed to the draining machines.

The advantage of the new method as compared with the older processes are very great as much smaller power is required.—Zentralblatt.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine).

Mark S. Wilder, receiver for the Remington-Martin companies, who is now in full charge of the operating of the mills of the company, states that no definite plans have been mapped out as yet for the reorganization of the companies. Various suggestions as to the financing of the properties have been advanced but no decision has been reached. One of the plans now under consideration is to float a bond issue of a million and a half dollars. Of this issue \$1,074,000 is to be retained to take up other bonds of the companies, and \$100,000. was to be held in the treasury. It is said that since the company has been placed in the hands of the receiver officers of the companies have had their salaries greatly reduced. Judge Ray has again granted an extension of time to Mr. Wilder to manage the bankrupt paper companies for thirty days from June 8. This extension was granted because the receiver has been able to conduct the companies' affairs at a profit.

* * *

The annual meeting of St. Regis Paper Company was held in New York during the past fortnight, and quarterly dividend of 1½ per cent. was declared. The dividend, which amounts to \$15,000, is payable on July 1. The following officers were chosen at the meeting: President, G. H. P. Gould; vice-president, Alva Miller; secretary and treasurer, George C. Sherman; general manager, D. M. Anderson. The following directors were elected: G. H. P. Gould, Alva Miller, George C. Sherman, D. M. Anderson, George W. Knowlton, J. Adolph Mollenhauer, P. D. Mollenhauer, J. Henry Dick and Jonathan Bulkley. The annual report, submitted and approved, showed a satisfactory financial condition, according to a statement by President G. H. P. Gould.

* * *

"The Log" has just made its appearance at Canton, N.C. It is published by the employees of the Champion Fibre Company, which supplies material to the Champion Coated Paper Company's plant in Hamilton, O., and follows the plan adopted in the Ohio city where "The Champion Spirit," a sprightly monthly paper, first made its appearance about five months ago. Both of these publications print news of direct interest to the thousands of employees and perform effective service in maintaining an interest in the mill activities. In their introductory, the editors of "The Log" declare that the name was selected on account of its peculiar significance.

* * *

The stockholders of the Granby Pulp and Paper Company, of Fulton, N.Y., have re-elected the following directors: D. A. Emerick, George P. Wells, C. R. Dines, Stanley B. Emerick and J. H. Howe. The directors in turn named the following officers: President, F. A. Emerick; vice-president, George P. Wells; secretary, S. R. Royce; treasurer, J. H. Howe. C. R. Dines was selected assistant manager.

* * *

The Savage Manufacturing Company this week filed a certificate of organization at Skowhegan, Me. The objects of the company are to manufacture pulp and paper. The company is doing a unique business, continuing the industry started by E. L. Savage, of mak-

ing paper for box linings, etc., from black stockings and newspapers. The stockings are used to give the various textures. It is said that this is the only firm manufacturing paper from these materials exclusively in the United States. About 26 hands are employed, and the demand is so great that Mr. Savage plans to increase the capacity of the plant. The company is capitalized at \$200,000, of which \$150,000 is common and \$50,000 preferred stock. Officers of the new company are James O. Savage, of Lawrence, Mass., president; E. L. Savage, of Skowhegan, treasurer; James O. Savage, Lawrence; Charles E. Savage, Groveton, N. H.; E. L. Savage, E. Bramhall, Minna B. Savage, Skowhegan, directors.

* * *

Geo. F. Baer, president of the Reading Paper Mills, of Reading, Pa., who died last month, left a personal estate of \$3,055,025. An inventory and appraisalment was filed with the register's office at Reading on June 20. The appraisalment follows: Deposit at Drexel & Co., Philadelphia, \$94,064; deposit at Schuylkill Valley Bank, Reading, \$3,245; proceeds from life insurance policies, \$58,476; farm stock, \$3,000; law books, \$1,600; office furniture, \$150; mortgage, \$8,000; notes, \$2,000; stocks, bonds and other interests, \$2,883,689. Total, \$3,055,025.

* * *

This appraisalment does not include the real estate which comprised Hawthorne, the Baer residence in Reading, a farm in Bern Township, a \$60,000 residence at 1718 Spruce street, and other property. While it includes no real estate, it does include the Reading Paper Mills, a stock company, with three plants.

* * *

Niagara Falls, N. Y., was the scene on the night of June 22 of an interesting meeting of John P. Lundrigan, industrial agent of the International Paper Company; Jeremiah T. Carey, president of the International Brotherhood of Paper Makers, and John Mullin, president of the International Union of Pulp, Sulphite and Paper Mill Workers, and the employees of the Falls International plant. Several interesting addresses were delivered. Mr. Lundrigan spoke against the men voting in favor of a strike because all their demands in a new agreement presented to the company last June 1 were not granted, and Messrs. Carey and Mullin favored standing firm for the agreement. The men took a vote but President Brydges, of the Falls local, would not make it public until given out with the vote cast by all the 38 mills of the company. From speaking with a large number of the men it was learned to-day that the Falls employees do not favor going out on strike.

* * *

James Wright, for the past seven years assistant manager of the plant of the Consolidated Water Power and Paper Company at Grand Rapids, Mich., has resigned. He is understood to be in the East at the present time. It is said he has another position in view, but is not ready to make his plans known. Mr. Wright was formerly with the Neenah Paper Company, at Neenah, Wis.

The annual meeting of the Halifax Paper Corporation, of Roanok Rapids, N. C., was held on June 15 at Richmond when these officers were re-elected: Job Taylor, president and general manager; L. M. Williams, vice-president and treasurer; directors, Job Taylor, L. M. Williams, Winthrop Chandler, P. L. Ezekiel, Charles Cohen, W. T. Reed, A. D. Williams, W. M. Habliston, and E. B. Addison. A very satisfactory report of earnings for the past year was submitted. The volume of business was about six times larger than the preceding period. The company manufactures a high-grade strictly sulphate kraft wrapping paper, and has its own chemical pulp mill, as well as paper mill.

* * *

Representing many millions of invested capital in one of the most important industries in America, five hundred paper manufacturers, jobbers and members of affiliated trades, assembled at the historic Butler county fair grounds, near Hamilton on Wednesday, June 17th, for the fifth annual mid-summer outing of the Miami Valley Paper Manufacturers' Association.

It was the most successful outing ever conducted by this popular and energetic organization, in point of attendance, and in all other respects it exceeded previous reunions. The first outing brought together 115, the second 225, the third 280, the fourth 325 and the final one approximately a half thousand.

The President of the Association, John J. Gibson, Jr., of the Wrenn Paper Company, Middletown, occupied the chair at the elaborate luncheon given, and Thomas Beckett, ex-president, J. F. Dunifur, W. W. Sunderland and the committee in charge of the outing, Chairman, Walter D. Randall, Hamilton; H. W. Nicholls, Lockland; Logan G. Thomson, Hamilton, and E. T. Gardner, Middletown, are to be congratulated on giving the Association one of the most enjoyable outings ever held in its history.

Interstate Commerce Commissioner Hall will sit at Boston, Mass., July 6 to hear evidence in the complaint of the New England Paper & Pulp Association against the Boston & Maine Railroad and others.

* * *

The Martin & William H. Nixon Paper Company is erecting a building in connection with its plant at Manayunk, Pa., to be equipped with new machinery, for replacing a branch of its industry that has just been razed.

* * *

Work on the new building of the Dubuque Paper Company at Second and Iowa Streets, Dubuque, Ia., will be started in a few days, as the strike of the brick-makers in Chicago has been settled and the men will start to work on Thursday. The strike was declared two months ago, the men demanding an increase of wages. This was refused and the men walked out and as a result building operations all over the country were stopped as the contractors were unable to obtain brick, although there were millions of them stored in Chicago, but it was impossible to obtain men to handle them.

* * *

What will go down in history as the most disastrous conflagration Saugerties, N. Y., has ever witnessed, since the burning of the Sheffield Paper Mills, occurred late Wednesday afternoon, June 3rd, when the building and valuable machinery and stock of the Tissue Company was completely swept away by the fire demon, and entailing a loss of \$200,000. The stock and machinery were valued at \$125,000 and the building

at \$75,000. The Tissue Company was organized about a year ago to manufacture crepe paper, paper napkins, table cloths, etc., and was located in the old Barclay Fibre Company plant which was rebuilt and new additions erected. The officers of the Tissue Company are Martin Cantine, president; Charles Coon, Jr., vice-president and general manager; B. F. Crump, treasurer, and James Dederick, secretary. The Directors are Benjamin Crump, Henry Dickhaut, Charles Mulford, Charles Coon, Jr., and James Dederick.

* * *

Peter G. Thomson, president of the Champion Coated Paper Company of Hamilton, Ohio, was acquitted June 4th, of a charge of bribery by a jury, in Justice Gould's Court, Washington, D. C., after fifteen minutes deliberation. The trial had been in progress for four weeks. The charge was brought against Mr. Thomson in May, 1910. The case had been set for trial five times and as often postponed. Thomson was charged by the Government with sending \$100 to Capt. W. P. Zant-zinger, a postoffice inspector, on duty at the Government Printing Office, who had to pass on the paper supplied by Thomson's concern. H. E. Thomson claimed he had nothing to do with this branch of the business; that his son, Peter Thomson, Jr., was in charge of it, and that therefore the indictment should not hold against him.

* * *

D. J. Halsted of Paterson, N. J., has been appointed receiver of the American Paper Company, which operates two mills on River Road, Bogota, N. J. The appointment is the result, it is understood, of an application made by President A. S. Matheson, of Summit Avenue, Hackensack. The concern, of which Mayor W. N. Smith, of Bogota, is the vice-president, and general manager, was incorporated in 1904 under the New Jersey laws with an authorized capital stock of \$400,000, of which about \$300,000 has been issued. President Matheson has always been the principal stockholder and controlled the company, and was looked upon as its financial backing. The company right up to date has always paid all obligations and the receivership is said to be the result of the company's inability to procure sufficient working capital. It is further said that the concern has been continually hampered for working capital from the start and have been obliged to extend their credit by giving notes for purchases of material and supplies. It is understood that the business will be continued as usual by the receiver. The officers of the American Paper Company are: President, A. S. Matheson; vice-president and general manager, W. N. Smith; treasurer, W. D. Matheson; general superintendent, C. P. Matheson.

* * *

The Court of Appeal in Albany, N. Y., has heard argument in the case of Edward N. Fournier, respondent, against the Union Bag & Paper Company, appellant. The appeal is from the affirmation of a judgment of the Saratoga trial term of \$5,500, in favor of plaintiff in an action to recover damages for personal injuries suffered by plaintiff September 23, 1910, when employed in defendant's paper mill in Ballston. The labor law was alleged to have been violated because the machinery was not guarded properly and a safe place provided in which to work. Fournier's left hand was crushed between revolving rolls when feeding paper into them. The defence was contributory negligence.

A contract for the manufacturing of 1,000,000 paper boxes for the largest system of five and ten cent stores in the world has just been closed by the Oklahoma Paper Company, at Oklahoma City, Okla. The boxes will be made for the Woolworth Company of New York and will be distributed from eighty-six of the big stores operated by that firm. Under the contract the company will receive \$20,000 for making the boxes, which are to be delivered for the Christmas holiday trade. Ben Hirschland, head of the Oklahoma Paper Company, says that the boxes will be chiefly distributed in the Western division of the territory occupied by the Woolworth Company, the eastern limits being Cincinnati, O.

* * *

To a petition asking for appointment of a permanent receiver for the Thames River Specialties Company, manufacturers of cardboard and paper in Montville, Conn., filed last week, an amendment was added on June 18, alleging that the business of the company has been conducted in violation of the Sherman anti-trust law, and contrary to the laws of Connecticut. Mary Deford Bigelow, holder of 326 bonds, and other bondholders, are the petitioners. In the amendment it is claimed that a majority of the directors of the company are engaged in an unlawful and fraudulent conspiracy and combination, the object and purpose of which is to control the output of cardboard and paper of various kinds in the trade, and to control the sale of paper and cardboard between the various states; to advance and control the prices of said paper and by preventing competition in them; that a majority of the directors are now in control and management of other concerns engaged in the manufacture and sale of cardboard and paper, and which should be competitors of the Thames River Specialties Company, and in competition one with another; and that said directors by means of combination and unlawful conspiracy intend to control and advance prices and to lower the quality of paper and cardboard. Maunsell Van Remselaer, the president, is temporary receiver of the company.

* * *

General Appraiser Somerville, sitting before the Board of United States General Appraisers in New York last week handed down his decision in the case of Chatfield & Woods Co., Cincinnati, Ohio, et al (protests (676,790 etc.) on wrapping paper. The shipment came from Sweden and was held entitled to free entry. The ruling in the case of the American Express Co. vs. United States (Canadian Reciprocity Act) 4 et. Customs Court Appeals, 146, T. D. 33,434, was followed in admitting the merchandise into this country.

* * *

The mill of the Forest Paper Co. at Yarmouth, Me., which has been closed down for a number of weeks to give an opportunity to reduce the stock on hand, has resumed operations again, and machines are running smoothly. Officials of the company expect to run the mill on full time for the rest of the year.

* * *

The Haverhill Box Board Company of Haverhill, Mass., filed a brief on June 17 with the Interstate Commerce Commission, asking that the Boston & Maine R. R. be required to carry paper box board and paper stock board at the sixth class rate, the same as friction board and cardboard.

* * *

William R. Janeway, president of Janeway & Co., noted as the oldest wall paper concern in the United States, announced on June 20 that his concern at New

Brunswick, N. J., would retire from the industry when contracts now in force have expired. Some will expire next month, and all will be finished soon.

"Foolish legislation," business uncertainty, and the resultant hazards and expenses of business were reasons Mr. Janeway gave for his decision to close his factory, which has prospered since it was founded, in 1844, until recently. During the last few weeks the force that at times consisted of 200 skilled workers, many of whom grew up with the firm, has dwindled to about 150. Mr. Janeway expressed himself as dissatisfied with, but not pessimistic, about trade conditions in general. "One man will tell you," he said, "that conditions will soon be flourishing, and another will say the land is going to the demnition bowwows. I will say that conditions are not satisfactory, but there is no danger at all of the United States going to the demnition bowwows. Neither is there any danger of New Brunswick permanently losing this industry. I can assure you I will find a buyer for the factory." The firm of Janeway & Co. weathered every panic or period of business depression in the seventy years of its life. On Feb. 4, 1884, two Pennsylvania oil trains collided, and the factory, which is near the railroad, caught fire and was destroyed. The result of this was that the business was soon lodged in other quarters.

* * *

After a month of idleness the Continental Paper Bag Company has opened its plant again at Watertown. The mill has been closed for repairs, and sufficient work has been finished to permit operations. All of the repairs, however, will not be completed for at least two months yet. The machines have been put in shape so that paper making might be gotten under way and the plant is now running comparatively smoothly. Three accidents during the few weeks preceding the closing of the shop caused the shut down. The plant was first held up owing to the breaking down of an engine. A few days later several freight cars were dropped down a siding into one of the walls, badly smashing one wing of the building. Fire broke out in the plant a day or two afterward, causing several thousand dollars' damage.

* * *

Advices from Fulton, N. Y., state that the Oswego Falls Pulp and Paper Company has won its suit against the State of New York for damages to its plant by the barge canal work, inasmuch as the absolute water property rights of the company are secured, although the money consideration was nominal. It will be necessary for the company to rebuild the power plant, similar to the one now under construction by the American Woolen Mills Company, and at a cost of about \$200,000. But the raising of the upper dam has greatly increased the water power, which especially in low water time will be of great benefit.

* * *

The net profits of the United Paper Board Company, of New York City, for the eleven months of its operation were \$206,970 or nearly double the profits of its predecessor, the United Box Board Company, for the corresponding period of the previous year. The company's earnings were at the rate of 10.75 per cent. per annum on its \$2,100,000 preferred stock. While the gross sales for the eleven months ended April 26 were smaller than the corresponding period a year previous by \$118,270, net earnings were larger by \$72,806, showing the good results of the economies effected in production.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

Paper made by union labor and bearing the label of the British trade unions of paper workers is now on sale in London and Manchester, and judging by the way things are going at present the unions are leaving no stone unturned to force manufacturers of paper to adopt the label. To fulfil this object a great conference will take place of paper workers from various countries, either in London or Berlin, within the next three months and some definite arrangements will then be come to with a view to forming a basis to compel all paper mills in paper producing countries to take up the label and place it on their products, thus showing that trade union hands were engaged in the output. The arrangements for this conference are not yet completed, but some announcement will be made in the near future on the matter.

A very interesting little ceremony took place the other day at the mill of Messrs. C. Davidson & Sons, Ltd., Mugiemoos, when Mr. Alexander Horne was made the recipient of a handsome presentation on leaving for Holyoke, in the States, where he is going to take up an important position in one of the paper mills there. It is not often Americans send to England for a paper worker, but Mr. Horne is a good man in the finishing department of a mill, and for 33 years he has worked with Messrs. Davidson & Sons, Ltd.

The Hele Paper Company is one of the best known British firms in the paper industry, and the company has also a reputation for having some of the oldest papermakers in the United Kingdom, if not in the world. There is quite a little band of them in the mill and the other day one of the retired foremen—who now acts as time-keeper at the mill—celebrated his 60th year as an employee. At eleven years' of age this old employe entered the mill—that was in 1854—and there he has remained ever since a faithful and trusted servant. To celebrate the event the president of the mill handed the old veteran a magnificent clock, on which was engraved an appropriate inscription. How many paper mill workers can boast of a record like this with one firm?

Notwithstanding the dullness that prevails in the British paper industry, it is reported by Wm. Dyson, secretary to the Amalgamated Society of Paper Makers, that a large contract for newsprint has been given by a large consumer in England to a Norwegian mill, and the price is two cents per pound, less a small percentage off. The contract extends to 1918 and Mr. Dyson says that the price and the placing of the contract outside British circles, creates a new difficulty for the British manufacturer, who is experiencing much trouble in not only trying to secure orders to keep machinery running, but in trying to get a reasonable price to cover the increased cost of production experienced lately.

Writing of Norway recalls the critical condition in which Norwegian pulp mills are in at the present moment. Some are dropping out of the paper trade and others are being converted into paper mills. At all events Norway is in a distressing state. At Drammen the Eker mill has been destroyed by fire and the Eng-

nes mill has stopped altogether. The Meraker mill has also been destroyed by fire and a rumor is current that it is not to be rebuilt, the power being turned to other use. Other mills on the Drammen river, owing to the dullness of the paper trade in general, have reduced their output whilst others have shut down their machinery until trade revives. At Fredrikshald one mill is closed until better prices can be realized for its products, whilst the owners of another pulp mill have decided to leave the pulp trade and build a paper mill. In Fraelandsfos a fire has partly destroyed a large mill and affected the output, of course. A reduction in the output, curiously enough, has not the slightest effect on the present low prices.

The British paper industry has not yet reached its normal position. Since the beginning of the year trade has been very dull and naturally the pulp trade is interfered with. During May the export trade of the British mills decreased considerably, according to the Trade Board returns, and the imports also show a decline, which means that more than the British mill owners are suffering from depression.

The following are the figures for May:—

	cwts.	£	cwts.	£
	1913	1913	1914	1914.
Imports	1,046,518	624,356	1,018,584	620,739
Exports	298,648	324,759	270,253	278,969

These figures include writing and printing paper, packings and wrappings, paper hangings, printed and coated paper, boards, playing cards, envelopes and bags. From Newfoundland 29,588 cwts. of printing paper on reels was imported in May, compared with 51,400 cwts. in May 1913, whilst for the five months since January the total is 134,123 cwts., as against 125,348 cwts. for the same period last year. Norway and Sweden are the largest suppliers of reel paper to the British markets and for paper not on reels Norway and Germany have the lead. Germany also supplies most of the paper hangings as well as the coated papers. In the imports Canada is not given in the list owing to the supplies from the Dominion being small. The British export trade includes 202 cwts. of writing paper to Canada (United States 367 cwts.) compared with 218 cwts. in May last year (United States 215 cwts.) and 13,656 cwts. of printing paper—mostly high grade papers—compared with 13,262 cwts. in May 1913. The States took 1,800 cwts., as against 3,035 cwts. The total export trade for the five months is:—writing paper to Canada 1,676 cwts., as against 2,716 cwts.; printing paper 38,704 cwts., as against 57,548 in May last year. The total trade of the British industry from January to May is now as follows:—

	1913	1913	1914	1914
	cwts.	£	cwts.	£
Imports ...	5,164,064	3,065,807	5,024,226	3,072,848
Exports ...	1,498,582	1,594,787	1,422,481	1,467,831

As already mentioned the dullness in the paper industry has affected the importation of wood pulps. The Trade Board figures for May are as follows:—

	1913 Tons	1913 £	1914 Tons	1914 £
Chemical	49,500	395,600	40,114	317,690
Mechanical	50,088	120,688	44,362	99,343

The figures for the five months ending May are:—Chemical 123,527 tons, as against 133,685 tons; mechanical 179,863 tons, as against 207,021 in May 1913. Norway was the largest supplier of bleached chemical (dry) in May, Sweden the largest supplier of unbleached (dry), with Norway next and Norway the biggest supplier of mechanical. From Canada 4,732 tons of wet mechanical was received in May, compared with 17,353 tons for the same period last year. The total for the five months is 13,934 tons, as against 19,923 tons for the five months, January to May in 1913. No sulphite or sulphate has been received from the Dominion, but in June a small cargo of sulphite has arrived.

A. E. Reed & Co., Ltd., held their annual meeting in London on the 11th May and from the company's report furnished your correspondent the company is paying a dividend of 10 per cent. and the net balance available for disposal was £97,096 13s. Mr. A. E. Reed, president, said the profits were some £3,000 less than the previous year, but that amount was more than covered by the loss occasioned by a fire which occurred at the Maidstone mill. He explained that the new building erected was practically fireproof, that four machines were to be erected—two were now working, one was just delivered at the mill—and by the time the third machine was in working order the mill would be restored once more to its normal production and the company hoped to have some benefits arising in the future. They proposed to add £5,000 to reserve this year as usual, and £25,000 to a special reserve fund to guard against contingencies. That, of course, strengthened the position of the company. Out of the whole of the production of their mills a very large percentage went to the daily, weekly and monthly publications in London and elsewhere, and that went on from year to year. Indeed, a great many of the publications they had supplied for over 10 years.

Other firms who have declared dividends are:—North Cornwall China Clay Co., Ltd., 7 per cent. on all shares, the president remarking that they had one of the finest clay sets in the world; William Tod, Junior, & Co., Ltd., 5 per cent. on the preference and 3 per cent. on the ordinary shares; Spicer Bros., Ltd., papermakers, 5 per cent. on preference shares, 7½ interim dividend of 2 per cent. Two hundred and fifty shares of £10 each (fully paid) in the paper mill of Guthrie, Craig, Peter & Co., of Brechin, were sold the other day, 15 realizing £9 2s 6d., 25 £8 17s. 6d. and 75 £8 10s. each.

The Associated Newspapers of London, a company that owns a large share in the Anglo-Newfoundland Development Co., have made a profit of £165,564, and they are paying a dividend at the rate of 10 per cent. The report of the company added: "The annual balance sheet of the Anglo-Newfoundland Development Co., Ltd., showed a profit of £65,054 for the year ended August 31st last, compared with £51,233 in 1912, and although no dividend was declared the directors' report showed that the company was making very satisfactory progress and that improved results might be expected in the future. The output of the mill is increasing and the quality of the paper and pulp produced by the company continues to be highly satisfactory."

The Canadian Board and Paper Company, the agents for the Laurentide Co., Ltd., J. R. Booth, McLeod Pulp Co., Ltd., and the Brompton Pulp and Paper Co., Ltd., have removed their offices in London from 69 Fleet St., to Windsor House, Kingsway, W.C. Kingsway, by the way, is one of the finest thoroughfares in London, and most of the progressive firms are taking up their abode in it, if they can obtain the room.

The British Consul at Dresden reports that the German paper trade, particularly those engaged in the production of packing and wrapping papers, has felt the depression in trade, and the demand has fallen 50 per cent., whilst raw materials are costing 10 per cent. more. Nevertheless wages advanced owing to a tariff condition that prevails.

The British Paper Makers' Association are going to establish a southern federation in England. They already have one in the north of England. This new move is partly on account of the recent growth of the Workers' Unions in the south, because it will leave the employers federated, and place them in a position to go as a body and meet the unions, which usually negotiate during times of a dispute, as a body, also. These federations are excellent things, because they bring employers and employees together in a bartering mood, with the result that many grievances are rectified and much unpleasantness removed.

FOREST FIRE PROTECTION STILL INADEQUATE.

The numerous and, in some cases, serious forest fires, which occurred throughout eastern Canada in May, prove that, while much is being done by the various provincial governments and other agencies, in forest fire protection, the provision is still inadequate in case of an extended drought. The strict enforcement of the permit system for the burning of settlers' slash would very materially reduce the number of fires. It is, however, hardly to be expected that, with the vast areas of forest lands, and the relatively small population to bear the burden, adequate fire protection can be secured on cut-over forest lands so long as practically no requirements are imposed upon lumbermen as to the disposal of inflammable debris is resulting from woods operations. The policy adopted by the British Columbia government in this matter is the most progressive of any in Canada.

PAPER-MAKING INDUSTRY IN SOUTH AFRICA.

The British Trade Commissioner for South Africa (Sir R. Sothorn Holland) reports that, according to information received from the Commissioner of Customs and Excise at Pretoria, the Chairman of the Industries Committee of the Pretoria Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and reports from Scotland indicate that this grass is nearly equal to esparto for paper-making purposes. It is stated that a capital of £20,000 would be sufficient to run a mill capable of producing a minimum of 15 tons of packing and coarser kinds of paper per week. In advocating the starting of a paper factory at Pretoria, the chairman points out that in addition to the grass, two of the principal articles necessary for the manufacture of paper, viz., lime and coal, are available in large quantities at a cheap rate.

NEW PATENTS

PULP BEATING AND WASHING MACHINES

By W. A. NEWTON, of Toronto, Ont., Patentee.

Canadian Patent No. 154,511.

This invention relates to improvements in Pulp Beating and Washing Machines used in paper manufacture, and the object of the invention is to produce a machine whereby the beating and washing of the pulp will be accomplished with less power and in a more

extending over the pan and consisting of longitudinal and transverse members, the bottom transverse members being adjustable, beater rolls mounted on the adjustable transverse members, knife plates suitably hung from the platform, suitably supported rotatable drum washer extending into the pan intermediately between the beating rolls and suitable means for rotating the tub, beater rolls and washing drums, the parts being arranged and constructed in detail, as shown in the accompanying drawings.

There have probably been more patents taken out on beating and washing engines than any other piece of paper mill machinery, and still the Hollander Type has lived through, and to-day is the standard beater.

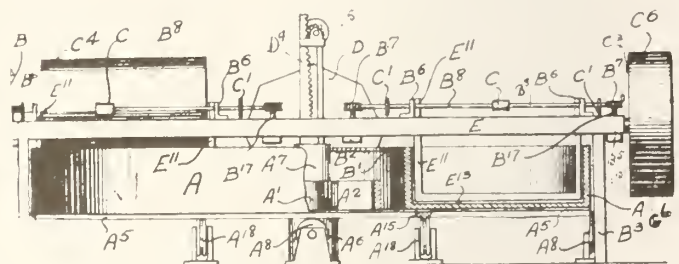
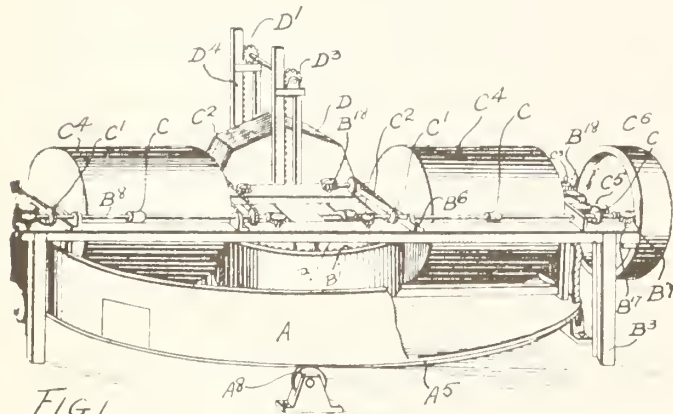


FIG. 3.

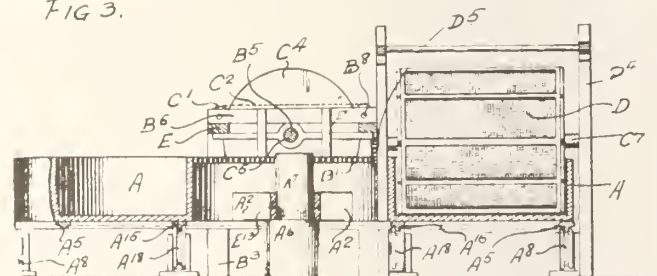


FIG. 4.

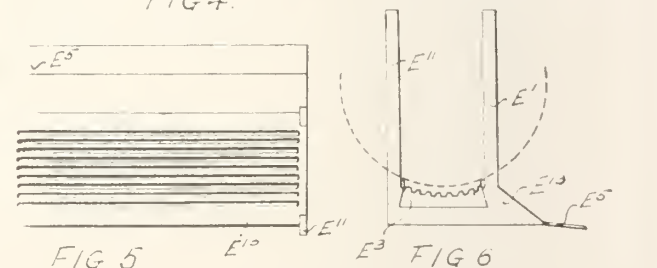


FIG. 5

FIG. 6

satisfactory manner. The invention consists essentially of the annular rotatable tub having inner and outer concentric walls, the half-cross section of the tub being substantially rectangular in form, T-shaped rails on the under face of the tub bottom, and parallel with the outer and inner periphery of the tub, a standard post having a reduced upper end, a bearing fitting the upper end of the post and having radial arms secured to the inner face of the inner tub wall, so that the tub is free to revolve on the post, fixed brackets carrying rotatable wheels to engage with the T-shaped rails to support the tub, an independently supported frame

In nearly every case, however, the patents have been on some method of improving the circulation of the stock, or decreasing the power necessarily consumed in raising the stock over the back fall, so that it will flow around to the front of the roll. To replace the back fall, we find patent covering paddle wheels, screw conveyors, pumps, etc., the reason being that the beater roll and back fall act very inefficiently as a pump, and any other means of lifting the stock more efficiently results in a saving of power, and since from forty per cent. to seventy per cent. of the total power consumed by the Hollander is used in raising the stock over the back fall, any improvement in efficiency results in considerable saving.

It is plain to be seen that if circulation from the back of the roll around to the front is accomplished without

lifting the stock over the back fall so that it will flow around by gravity, the majority of the total power required by the beater would be eliminated, provided the new means of circulation did not consume this power.

This is what has been accomplished by this invention, the back fall has been eliminated and not only will the power be reduced, but it also has the following additional advantages:

The circulation is positive and the stock close to the walls of the tub passes between the roll of bed-plate as often as the stock laying farther away from the walls, which is not true of any other beater. The stock may have as high a consistency as is desired without interfering with the circulation, which is not possible with any other beater. Five per cent. of stock to ninety-five per cent. of water being common practice. Construction of the roll need not be as complicated, since it does not act as a pump, and the beater is therefore adaptable to any combination of stone or steel rolls, stone or steel bed-plates, washing drums, etc. The mechanical construction of the various parts will vary more or less, depending on the capacity.

Claims

1. In a pulp beating machine, the combination with the revolving beater drum, of a pan, and means for revolving the pan so as to feed the paper stock to and from the drums, as and for the purpose specified.

2. In a pulp beating machine, the combination with an annular pan, means for rotatably supporting the pan, and means for rotating the pan, of a stationary frame extending over the pan, means for independently supporting the same, beater drums carried by the frame and co-acting knives and carriers therefor supported by the frame beneath the drum, so and for the purpose specified.

3. In a pulp beating machine, the combination with an annular pan, means for rotatably supporting the pan, and means for rotating the same, of a stationary frame extending over the pan, means for independently supporting the same, beater drums carried by the frame and co-acting knives and carriers therefor supported by the frame beneath the drums, and means for adjusting the drums to take up the peripheral wear thereon, as and for the purpose specified.

4. In a pulp beating and washing machine, the combination with the annular rotating pan and an annular horizontal gear carried thereby, of suitably journaled washer drum shafts arranged radially of the pan, a gear mounted on each shaft and engaging the annular gear of the pan, and washer drums mounted on the shafts, as and for the purpose specified.

5. In a pulp beating machine, the combination with a suitably supported revolving pan, of an independently supported frame comprising longitudinal and cross connecting members, movable cross members, means for vertically adjusting the movable cross members in relation to the frame, beater drum shafts journaled thereon, beater drums mounted on the shafts and co-acting knives and knife frames carried by the said frame, as and for the purpose specified.

6. In a pulp beating machine, the combination with a suitably supported revolving pan, of an independently supported frame comprising longitudinal and cross connecting members, movable cross members, a threaded spindle extending throughout the movable members and bearing on the cross members of the frame, and means for simultaneously turning such threaded spindles, as and for the purpose specified.

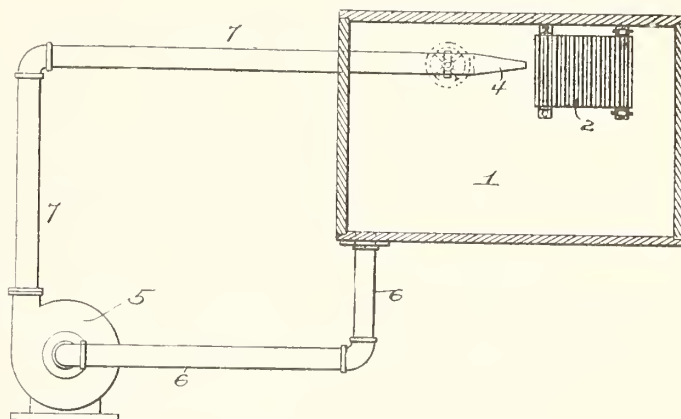
William H. Stobie, of Waterville, Maine, has taken out patents in the United States on four inventions relating to the pulp industry. They are:

Process of Disintegrating Fibrous Material Used in the Manufacture of Paper-Pulp. No. 1,099,578.

My invention relates to an improvement in the process of disintegrating fibrous material used in the manufacture of paper pulp, the object being to divide or separate the fibres without breaking or cutting them, thereby producing a stock that will felt better than the stock from an ordinary beating engine, and my invention consists in mixing the fibrous material with water and projecting it in the form of a jet, against a roughened or serrated surface.

My invention further consists in drawing the stock from a vat, by means of a pump and projecting it in the form of a jet against a roughened surface located within the vat, and continuing the operation until the fibres have been thoroughly separated from each other. change its position relative to the discharge nozzle 4.

Leading from the bottom of tank 1 to the pump 5 the pipe 6, and leading from the pump 5 back to the tank 1, is the discharge pipe 7, terminating within the tank in the nozzle 4, the discharge end of which may be circular or oblong. The nozzle is so located with



relation to the serrated plate 2 that the stock will be projected against the serrations at an angle or with a glancing blow, and is kept circulating through the tank, pump and pipes against the serrated plate, until the stock has been reduced to the required consistency. This contact of the stock with the roughened face of the plate reduces the material to fibrous form without impairing the strength, or reducing in length, the fibers of the original pulp.

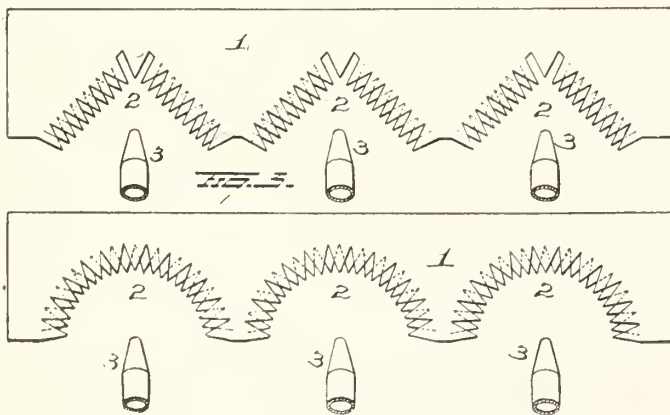
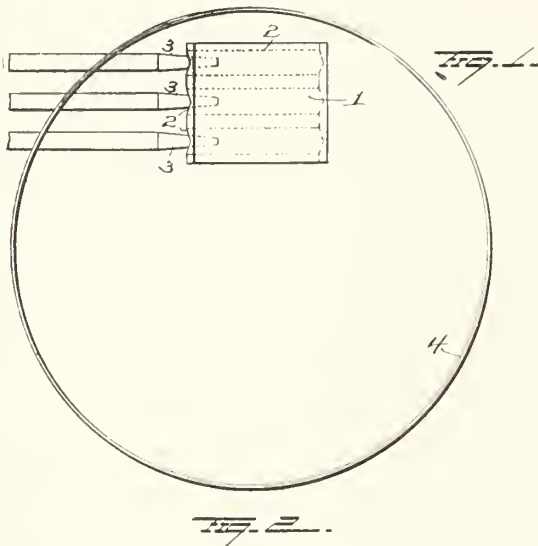
The target 2 is unconfined, that is to say, it is not provided with marginal flanges or walls and is so located with relation to the walls of its inclosure that the liquid pulp after its contact with the target, will be unrestrained and free to fly out of the path of the incoming stream, and the target is of such size in proportion to the stream, that ample room is provided for the spreading of the stream or jet after it strikes the target.

Again instead of circulating or repassing the stock through the vat and pump until it has been reduced to the desired condition. I may simply as one step in the process, project the stock against the serrated plate, and then pass it to a reducing engine or other apparatus employed in the paper making process. The action of the serrated face, on the stock, is to divide

or separate the fibres without breaking or cutting them and experiments have demonstrated that stock can be prepared, by this process, for the paper machines without any treatment whatsoever in the old style of

The accompanying drawing is a diagrammatic view of one form of apparatus for carrying out my process.

1 represents a vat or tank to contain the paper stock which has been previously mixed with the proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes, and 2 is a plate or target within the tank and provided with a serrated surface. This plate is preferably made of metal, but it may be of sand stone or other material and may be an integral structure or made up of sections, and it may also be fixed, or adjustable so as to beaters.



Apparatus for Disintegrating Pulp. No. 1,009,579.

This invention relates to an improvement in apparatus for disintegrating pulp, the object being to provide improved means for dividing or separating the fibres of the stock, without breaking or cutting them into short lengths, thereby producing a stock that will felt better and more uniformly than the stock from an ordinary beating engine, and my invention consists in a target having a groove or gutter and a nozzle discharging the pulp into said gutter in the direction of the length of the latter, the face of the gutter being serrated or roughened.

My invention further consists in providing a rectangular target or slab with a series of gutters, and a discharge nozzle for each gutter, each nozzle discharging in the general direction of the length of the gutter.

My invention further consists in certain details of construction and combinations of parts as will be more fully explained and pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view in plan of my improvement. Fig. 2 is a view in end elevation of the target, and the nozzles in their proper relative positions, and Fig. 3 is a similar view of a modified form.

1 represents a target preferably made of metal, but which may be made of stone, emery or other suitable material. This target is preferably rectangular in shape and is provided with a plurality of grooves or gutters, 2, V-shape in cross section and extending in the direction of the length of the target. Each target may, however, have only one gutter. The surfaces of the gutters are serrated or toothed as shown in Figs. 2 and 3, and the nozzles 3 are located so as to discharge the pulp against the target in the direction of the length of the gutter. The nozzles are located with their long axis approximately in line with the center of the gutters, as shown in Fig. 1, and preferably tangentially thereto as shown in Figs. 1 and 2 so as to strike the target a glancing blow, thus causing the pulp to spread out and make repeated contacts with the serrations before it leaves the target. The gutters are located, preferably on the inner or lower face of the target, and the targets are preferably slightly inclined downwardly, so that the pulp stream from the nozzles, which are located horizontally below the targets as in Fig. 1, will be deflected into the vat or tank 4, thus preventing any upward splashing of the pulp. This pulp may be carried by means of a pump and pipes from the tank 4 to the nozzles, continuously until the pulp has been properly disintegrated, and the target may be adjustable longitudinally so as to present a new working surface to the action of the pulp streams, whereby the whole serrated surface of the gutters may be used up before removing the target for redressing or replacement.

The target is preferably located in the vat containing the paper stock which has previously been mixed with a proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes to the nozzles 3, which are so located as to forcibly discharge the streams against the serrated faces of the gutters and tangentially thereto. With the targets located in the vats, the stock falls back into the vat and will be carried around and again forcibly projected against the targets until it is in proper condition for felting. The targets may, however, be located outside of the vats, so that the stock after one contact with the target, may be collected and carried off for the next step in the process.

In the construction shown in Fig. 3, the gutters are preferably semi-circular in cross section, instead of being V-shape with flat surfaces as in Fig. 2. The action of the serrated or toothed faces on the stock is to divide or separate the fibres without breaking or cutting them or reducing their lengths, and the object in providing the targets with elongated gutters and forcibly ejecting the stock into the gutters in the direction of the length of the latter and tangentially thereto, is to more closely confine the stock and cause it to make repeated contacts with the serrations before it falls back into the vat.

Apparatus for Disintegrating Pulp. No. 1,099,580.

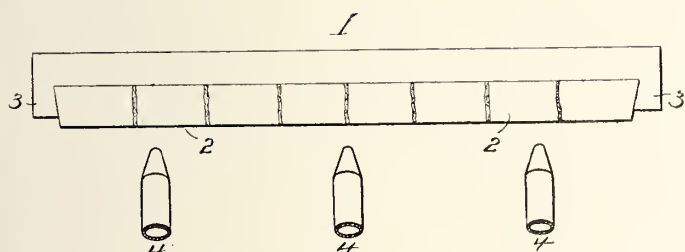
This invention relates to improvements in apparatus for disintegrating pulp, and more particularly to the targets constituting a part of said apparatus.

The object of the invention is to simplify and cheapen the cost of construction of the targets, and it consists in the details of construction as will be more fully described and pointed out in the claims.

The accompanying drawing is a view in section of the target showing the pulp discharge nozzles through which the pulp is projected against the target.

In apparatus wherein these targets are used, the paper stock which has previously been mixed with a proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes to the nozzles, is pumped and forcibly ejected through nozzles against a target having a serrated or roughened face for the purpose of disintegrating the fibre and putting it in proper condition for effective felting. These targets have heretofore been made of metal, and also of stone, and when made of stone have been in one integral piece.

My present invention is designed to simplify and cheapen the cost of production and repair of the targets, and it consists of a metal frame 1, either square, rectangular or circular into which blocks 2 of sandstone, basalt, carborundum or any other suitable stone or material are placed and secured by cement or otherwise. The frame 1 is provided at its outer edge or periphery with a flange 3 which latter is undercut as shown, and the end blocks at the sides, or periphery as the case may be, are correspondingly beveled to take



under the flanges 3. The blocks may be of any size but are preferably so shaped at their edges to make close joints with the adjacent blocks and they are all secured together by cement or any other suitable binder. The natural surfaces of unsmoothed blocks may be used, but the best results are obtained by having the surfaces roughened by grooves more or less pronounced according to the stock used and results desired. The target so constructed is employed in connection with a plurality of nozzles 4 which latter discharge the stock upwardly at an incline against the roughened faces of the blocks, the contact of the stock with the stone slab operating to separate and disintegrate the fibres without cutting or shortening them.

If desired the target may be set at a slight inclination and the nozzles be horizontal and so placed with relation to the target that the pulp will strike the latter tangentially, and, under its impetus from the nozzle, move in contact with the target for some little distance before falling back into the vat in which the target is usually located. Again the target is of such size that it can be moved sidewise to present new working surfaces to the pulp streams, thereby permitting the whole surface of the target to be used up before removing it for renewal or repairs.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and

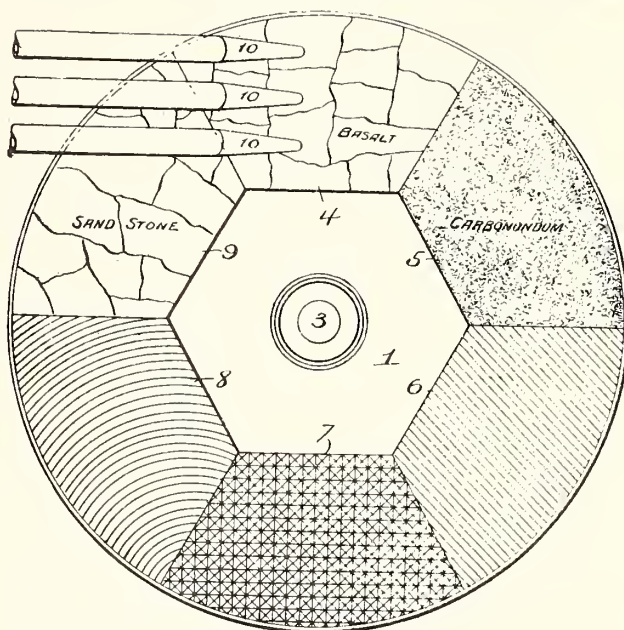
scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described.

Apparatus for Disintegrating Fibrous Material. No. 1,099,581.

This invention relates to an improvement in apparatus for disintegrating fibrous material used in the manufacture of paper pulp, the object being to provide a target against which the stock is forcibly projected, with a plurality of surfaces of different milling capacity, the target being adjustable whereby any one of said surfaces may be readily moved to a position to receive the discharge from a stock projecting nozzle.

With this object in view my invention consists in the parts and combination of parts and in the details of construction as will be more fully described and pointed out in the claims.

The accompanying drawing is a view in elevation of my improved target, also showing the nozzles through which the stock is projected against the target. Paper stock intended for very thin paper must



be treated differently from that intended for heavy paper. It is also desirable to change the targets, where a change in the grade of material is necessary, and again it may be desirable in order to shorten the process, to work the stock against one surface, say a plate having sharp pyramidal projections which will quickly separate and divide the fibers, and conclude the operation with a plate having a less roughened surface, as for instance sandstone or carborundum.

My present invention provides a target having a series of surfaces of different milling or disintegrating capacity, and it consists of a disk 1 provided with a peripheral flange 2, the disk being centrally secured to a shaft 3, by which it may be turned to present any one of the several disintegrating surfaces 4, 5, 6, 7, 8 and 9 to the pulp or stock streams which are forcibly ejected from the nozzles 10.

The disk 1, in the present instance carries the cutting blocks or surfaces, on one of its faces only, but it may have them on both faces, in which event a second set of nozzles would be located to project the stock against the opposite face. Again the disk may be horizontal with the nozzle above or below same, or ver-

tical with the nozzles at the side. The nozzles 10 are located at an inclination to the working face of the disk so that the stock will be projected tangentially against the milling surfaces of the several working sections of the disk.

The working sections may be composed of basalt or lava stone, one of carborundum; one of sandstone and several of metal or stone having serrated faces. In one, the serrations or ridges are shown extending in straight lines transversely across the section in another the serrations are curved and in another the face of the plate is made up of a series of small pyramids. If stone or composition sections such as sand stone, basalt or carborundum be used, the surfaces may be either grooved or serrated, or left in their natural rough condition. The material used for the working section and the method employed for producing the roughened or serrated faces is unimportant, as the principal object is to provide the disk with a series of working surfaces so as to provide for varying cutting or disintegrating capacity.

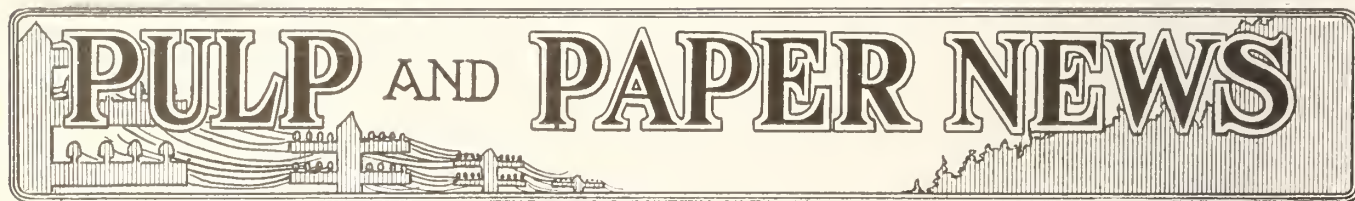
By first projecting the stock against a serrated plate the stock will be quickly disintegrated and by finishing up with a sandstone, lava or carborundum surface the stock will be more finely divided and the fibers as perfectly separated as they can be in the ordinary beater engines and in much less time and at but a

fraction of the cost.

The nozzles 10 are connected to pipes leading to a pump which draws the stock from a vat in which the target is located. The nozzles are so located with relation to the disk that the stock will be projected against the roughened surfaces tangentially and then fall back into the tank, and is kept circulating through the tank, pump, and pipes against the target until it has been reduced to the desired degree of fineness. This contact of the stock with the roughened surfaces separates or pulls the fibers apart without seriously impairing the strength or reducing the length of the original fibers.

Instead of circulating or repassing the stock through the vat, pump and nozzles until it has been reduced to the desired degree of fineness, it may after one contact with the target be passed on to a reducing engine or other apparatus employed in the paper making process.

The action of the roughened faces on the stock is to divide or separate the fibers without shortening them and this is what is meant by the term milling used in the specification and claims and actual use of the apparatus has proved beyond question, that stock can be prepared, by this apparatus for the paper making machines without any treatment whatsoever in the old style of beaters.



(Special to Pulp and Paper Magazine.)

The F. N. Burt Co., Toronto, have declared their regular quarterly dividend of one and three-quarter per cent. on the preferred stock of the company and one and one-half per cent. on the common stock. The Pacific Burt Co., Toronto, have also declared their regular one and three-quarter per cent. on preference and regular half yearly one per cent. on common. The Toronto Paper Manufacturing Co., whose plant is located at Cornwall, passed their regular quarterly dividend of one and one-half per cent. on the stock for the present quarter. This has been thought best in the present interests of the company in view of the quiet state of the market, and to strengthen the reserves.

A representative delegation of the Rochester Chamber of Commerce recently spent several hours in Toronto and were entertained to an automobile drive and afterwards to dinner at a banquet. W. P. Gundy, who is Vice-President and Managing Director of the Kinleith Paper Mill, and W. J. Gage Co., President. Mr. Gundy is also President of the Toronto Board of Trade.

At the annual meeting of the Standard Chemical, Iron and Lumber Co., held in Toronto last week, the annual report showed that the floating liabilities had been reduced from \$1,090,000 on December 31, 1913, to \$690,000 on May 1 of the present year. Further substantial reductions are being made and the business of the company is reported to be in a sound condition while the general situation is improving gradually. L. M. Wood was re-elected President, N. L. Davies, Vice-Pres., and A. Greig, General Manager.

F. H. Gage of Toronto, for several years sales manager of the Kinleith Paper Co., Limited, whose mills are at St. Catharines, Ont., has resigned and leaves on July 7 for an extended trip to Great Britain and the Continent, where he will join his wife and family. He has been succeeded by Lawrence A. Dance, for some time with W. J. Gage Co., Toronto. Mr. Gage has been connected with the paper trade for over twenty-two years and on his return home will devote himself to representing several special lines.

The Kinleith Paper Mills of St. Catharines, Ont., which recently laid new concrete floors in the beater room and installed new beater tubs, have completed the work. The second machine of the company was started up again this week.

The many friends of Sir Adam Beck, who is widely known in connection with his splendid work in the hydro-electric interests of Ontario, now supplying over seventy thousand customers, and whose business enterprises as a box manufacturer are located in several cities of the province, will congratulate him on being one of the recipients of King's Birthday honors.

H. M. Thorne, Secretary Treasurer of the Canada Paper Co., Montreal, has returned from spending a pleasant holiday at Lake Placid in the Adirondack Mountains.

A serious fire visited Grimsby, Ont., on June 17, when the plant of the Consumers Lumber and Box Co. was destroyed by fire, damage being done to the extent of \$25,000, including \$7,000 on new machinery just installed. The insurance amounted to only \$25,000.

D. J. Albertson of Kalamazoo, Mich., the widely-known paper mill engineer, was in Winnipeg, recently conferring with L. N. Austin of the Austin Paper Co., in regard to an extension of the plans which the latter prepared some time ago for the erection of a new mill which will convert flax straw into paper. It is understood that the project will soon be rushed ahead to completion.

A. A. Wheat, who is a director of the St. Lawrence Paper Mills, Toronto, and for some years has been superintendent of the Kalamazoo Paper Co., Kalamazoo, Mich., has been appointed superintendent of the Elkhart Paper Co., of Elkhart, Ind. He has been Vice-Pres. and a member of the board of the latter concern for a couple of years.

The annual meeting of the Wayagamack Pulp and Paper Co., will be held at the offices of the company at Three Rivers on July 16. At the last meeting of the Board a resolution of condolence was passed in connection with the death of James Reid Wilson, and a copy ordered to be sent to Mrs. Wilson and family. Expression was given to the keen sense of personal loss in the removal of one whose advice and good judgment, together with his unbounded faith in and financial support to their enterprises, had proved a source of much strength to the company.

The International Joint Commission which last summer determined the extent of the pollution of international streams, will further continue its work and hold sittings in Toronto, Detroit and Niagara, to take the necessary steps to prevent pollution and adopt a remedy best suited to the cases to be considered.

H. B. Donovan, of Toronto, Sales Manager of the Canada Paper Co., is on an extended trip to St. John, Halifax and other eastern points.

Cornelius Redmond, who for some four years was superintendent of the Montrose paper mill at Thorold, Ont., and resigned last fall to spend several months in California, has been appointed superintendent of the Kalamazoo Paper Co., Kalamazoo, Mich., and has entered upon his new duties.

J. F. Ellis of Barber-Ellis Limited, Toronto, and wife, who have been spending the past few months in Europe, have returned after an extended trip.

The McLaren Lumber Co. of Coleman, B. C., who own 181 square miles of timber limits, will treble the size of their plant and will be able to cut twenty million feet of lumber a year.

On June 24 the marriage took place in Toronto of J. B. O. Kemp, B. A. Sc., to Miss Emma Isabel Donovan, only daughter of H. B. Donovan, sales manager of the Canada Paper Co. The ceremony was performed in Bonar Presbyterian Church by Rev. Dr. McGillivray.

The offices of the Howell Trading Co., 109-111 George street, Toronto, will shortly be enlarged and renovated. The premises are also occupied by the Standard Paper Co., who specialize in building and roofing lines. A large warehouse is being erected at the rear, 80 x 100 feet in dimensions. It will be of brick, mill construction, five stories high and basement with six-inch Norway pine floors. The structure will be used by the Howell Trading Co., at the head of which is G. A. Howell, for storing paper, and all general supplies, the firm having developed a fine business in the storage line.

It is understood that in the tenders received by the T. Eaton Co., of Toronto, for five hundred tons of unglazed kraft, the contract was awarded to the Brompton Pulp and Paper Co. at East Angus, Que.

In a fire which visited Brockville last week the wood working department of the James Smart Co. was completely destroyed. The loss was \$20,000.

The annual meeting of the Canadian Press Association will be held in Toronto on July 9 and 10. The sessions were to have taken place at the Royal Muskoka Hotel, Lake Muskoka, in June, but had to be postponed owing to the Ontario elections as many members could not get away. The convention this month will be purely of a business character, all the entertainment features being eliminated.

J. B. Beveridge, Manager of the Dryden Timber and Power Co., Dryden, Ont., was in Toronto last week on his way to Chicago. The company report business as good. The output of pure kraft fibre has been increased and the general quality improved. There is no stock on hand and the firm have orders ahead for some time. The Howell Trading Co., Toronto, who are selling agents for the Dryden concern in Eastern Canada, have had their territory increased and now cover Michigan, Ohio, Iowa, Indiana and Illinois.

The demand for wax paper for bread-wrapping purposes is steadily increasing and the British-American Wax Paper Co. of Toronto, who have six waxing machines, have recently taken still more space in the Darling building. The company now occupy about seventeen thousand square feet and intend next year to erect their own building which will be devoted entirely to manufacturing purposes. H. B. Hart, manager of the company, returned last week from a visit to the American plant of the company in Cincinnati, Ohio.

The Interlake Tissue Mills of Thorold, Ont., are manufacturing summer specialties and are putting several new lines on the market. These consist of Outing Sets in glassine paper bags composed of two heavy crepe paper table covers and twenty-five napkins. The company are also making decorative crepe for lamp shades, curtains, wall panels, carnivals, flower parades, etc. in ten, fifteen and twenty foot rolls and in thirty-six different colors. Sani-white crepe paper napkins, one hundred to the package, and travelers' sanitary packages, pocket size, with six towels, a portion of soap, a wash rag and portion of face powder are now being turned out. The company have also been busy producing fruit wrappers for British Columbia.

Joseph Kilgour of Sunnybrook Farm, Toronto, captured five firsts, two seconds and seven other prizes at the first Hamilton horse show last week. Mr. Kilgour is the President of the Canada Paper Co. and his many friends are congratulating him on his success at the various horse shows in which Sunnybrook Farm equines have taken part.

C. P. R. REORGANIZES FIRE PROTECTION STAFF

The Canadian Pacific Railway has recognized the local administration of the special fire patrols on its western lines, required by the Board of Railway Commissioners, by placing the matter under the direction of its Forestry Branch, of which Mr. R. D. Prettie is Superintendent, with headquarters at Calgary. The new arrangement affects the handling of fire protection work on all lines of the C. P. R. running through forest sections west of Fort William, Ont. The C.P.R. Forestry Branch has previously been closely associated with fire protection work, through the assignment of inspectors, but the new arrangements will greatly increase its scope by giving it administrative control as well. The new plan is altogether logical in an age of specialization.



CANADIAN MARKETS

The market in news print continues very good and all the mills appear to be busy. Prices are well maintained and exports to the United States continue to grow rapidly. During the past fiscal year ending March 31, the value of print paper sent across the border was just double that of twelve months previous. The figures for the last fiscal year amounted to \$11,386,845 against \$5,692,126. It is expected that during 1914 when several hundred additional tons will come on the market that the gain will be equally as large. The export of mechanical pulp remains about stationary, according to the latest returns, while chemical pulp showed an advance of thirty-six per cent. in shipments to the south as contrasted with the year previous. Business with book, writing and coating mills continues fair and there appears to be a moderate amount of trade ahead. Orders are not so plentiful as a year ago and are smaller and harder to secure. The wrapping paper situation and the dealings in kraft remain about the same, price cutting continuing but not to any greater extent than for some months. Toronto wholesale paper houses report that the tone of business is improving slightly but matters are not expected to pick up very much during the usually quiet midsummer holidays. In ground wood things are only fair and complaints are still heard regarding water conditions. In the rag and paper stock arena there is little doing and prices are easier particularly on roofing stock. Following are the quotations, f.o.b. Toronto:

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.50, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.56½ to \$3.25.
 Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$16.
 Ground Wood, \$21 to \$24, delivered in United States.
 Sulphite (unbleached), \$41 to \$43, delivered in Canada.
 Sulphite (unbleached), \$42 to \$44, delivered in United States.
 Sulphite (unbleached), \$55 to \$58, delivered in Canada.
 Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.

No. 1 mixed shavings, 45c.
 White blanks, 87½c to 90c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.27½ to \$1.30.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinets, 70c to 72½c.
 Flock, 80c to 82½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

(Office Pulp & Paper Magazine, 206 Broadway, N. Y.)

June 25, 1914.

Ground Wood.

There has been a somewhat increased activity in the inquiries for ground wood pulp in the interval. Movement has been chiefly confined to regular shipments on contract request to consuming centres. The fact that water has been rather shortened in some of the western and middle western manufacturing centres has caused certain mills to make inquiries regarding deals for ground wood pulp. Among these inquiries are some from sources which have never before come into the local buying centre. A year ago a certain manufacturer was left with 25,000 tons of ground wood on hand. This enormous pile has been entirely sold with the exception of about 4,000 tons, which is gradually diminishing under spot demand in lots varying from 20 to 150 tons. The lowest price quoted for this stored pulp since the first of the year is \$15.08 at the pulp mill. Manufacturers have requested commission men to accept nothing lower than \$16.50 at the mill for fresh pulp. The feeling here is that the current year will be a good one in ground wood. Those who requested suspension of shipments have resumed their normal lots and pulp is now moving fairly well.

Chemical Pulp.

The weakening tendency in chemical fibre still predominates in the local market. Values are not firm in spot lots which have been closed as low as 1.70c on the dock for No. 1 unbleached sulphite. An offer of 2.60c for No. 1 unbleached sulphite has been made to certain manufacturers in the local market. Contracts are sparse and as paper manufacturers are pretty well aware that there is sufficient pulp in store on this side to meet their immediate needs, they are inclined to withhold from any contract arrangements which cannot be made at the low values for which they can purchase spot lots.

Mills have plentiful supplies on hand and are not anxious to buy any more stock until a better demand for their product exists. There seems to be an overproduction of sulphate and kraft pulp which has been firmly held for better values by foreign manufacturers. The general weakness of the paper market here, however, has necessitated some concessions in favor of the paper manufacturer. Spot kraft is not commanding more than 1.70c to 1.85c a pound. Contrast values are held by some of the largest importers at 1.80c to 2c, however it seems that this price range may fall off in the opinion of some.

Rags.

Rags and bagging are in poor demand and prices of all grades are very weak. Foreign rags are scarce in warerooms abroad and it is reported here that one of the largest packers in France cannot get sufficiently large collections of rags to keep his help occupied more than three days a week. Packers abroad also specify in their quotations that they are absolutely rock bottom and any counter offer will be useless.

Board.

Board mills are not as active as they were during the early part of the year and as a result there has been a good deal of easing in the value of the lower grades

of old waste papers and there are large accumulations of them in warerooms about the city. Book mills are a little less active and this has caused some easing in some of the better grades of old waste papers. Hard white shavings are in rather poorer demand and values are about 2.30c to 2.40c. Flat stock of all grades is in more demand than any other grade.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$15 to \$17, delivered.

Unbleached sulphite, dom., 1.90c to 2.00c, delivered.

Unbleached sulphite, imptd., 1.85c to 2c., ex. dock, New York.

Bleached sulphite, domestic, 2.75c to 2.90c, delivered.

Bleached sulphite, imptd., 2.60c to 2.85c ex. dock, New York.

Easy Bleaching, imptd., 2.05c to 2.15c ex. dock, New York.

Unbleached sulphate, imptd., 1.75c to 2c, ex. dock, New York.

Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.

Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

Although there has been no real improvement in the general situation in the local market, most mills are running on fairly good time. There has been some difficulty with certain mills which could not meet their immediate obligations and they have asked extensions which will probably be granted. The market is one of hard to mouth buying. Advices from all parts of the country show that stocks are low and that jobbers are placing orders only in cases of necessity and of only such volume as will satisfy their immediate orders. The specialty business has been fairly good. Crepe tissues and paper towels have been in good demand which is probably the result of a widespread demand for sanitary service in public resorts. Paper cups are also in active demand. One of the large converters and tissue manufacturers was crippled by a total loss by fire. This caused a distribution of its business among the other manufacturers and has strengthened the market a little as certain mills which had planned a shut down during the summer are now sufficiently supplied with orders to keep all machines running full for some time to come. The demand for newsprint has been confined to requests for contract delivery. Although advertising has been light during the first half of the year, the Mexican war scare caused heavy editions and many extras which increased circulation so much as to bring about a heavier consumption of news than last year. There is a healthy demand for side runs probably due to the opening of many summer resorts. Some manufacturers are unable to make deliveries on new orders of side runs within the next six weeks. The local price is 2c to 2.05c for nines, twelves and fifteens, while eighteens command about 1.95c. Wrappings are in rather poor demand but values are fairly firm. Book papers of all grades are firm in value under a rather quiet demand as this is the off season. There has been considerable unnecessary cutting of prices by brokers and some manufacturers in the bag business which shows a little more activity especially for fruit and candy sizes. Boards are rather quiet but there is very little price cutting. As building has been slow this year there is but a poor demand for roofing and building papers. Writings are in rather quiet demand

but values are firmly maintained as manufacturers cannot afford to cut prices any further. Kraft papers are in poor demand and values are weak.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
 News, side runs, 1.95c to 2.05c.
 News, sheet, \$2.25, to \$2.30 f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 4 $\frac{3}{4}$ c to 5c, delivered.
 Manila, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. New York.
 Boxboards, news, \$28 to \$30 per ton, delivered.
 Boxboards, chip, \$28 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42 $\frac{1}{2}$ c f.o.b. New York.
 Tissue, fourdrinier, 17 $\frac{1}{2}$ c to 50c f.o.b. New York.
 Tissue, jute Manila, 40c to 41 $\frac{1}{2}$ c f.o.b. New York.

THE BRITISH MARKETS.

London, June 20, 1914.

The British paper trade is anything but in a brisk state, which leaves it in common with most of the continental markets. Complaints are general of the small amount of business that is passing, and to make matters worse the export trade shows no signs of a revival. A couple of months ago it was chiefly the mills engaging in the production of packing, wrapping and other kinds of kraft paper that were mostly affected, but now the newsprint and fine printing and writing paper mills are having a set-back, and some of the mills in the Lancashire area are being badly hit for the want of new orders. This state of affairs means increasing stocks, with the result that prices must go down and an outlet found some place at a subsequent period, so that the mills may be cleared out. Naturally competition is very keen and a good deal of uneasiness prevails. Mills having a good connection amongst steady and constant consumers are about the only ones that can show any profit, but those depending largely on the export trade and with a small home connection feel the pinch of the depression more than the others. It is quite evident, however, that the present state of things cannot last much longer. All the printing and publishing houses are working steadily, so that they are consuming a fair

amount of paper, but nothing like that they consumed at this time twelve months ago.

Deliveries of sulphate and sulphite under contracts have been fairly large during the past month, and they give an indication of the size of the contracts that papermakers have entered into with Scandinavia. At present business in pulps is not active. Contracts for sulphate are being entered into, the low prices prevailing being the great attraction, but for sulphite business is on a hand to mouth principle, and sellers are firm in their quotations, so that contracts are few. The reports from Scandinavia and Germany that reach London show that the depression in the paper trade has a great influence on the pulp trade and there is no disposition on the part of buyers to go beyond small prompt parcels. The prices in England at present are about as follows:—

Sulphite Bleached (No. 1)	...	\$56.60 to \$61.50
Sulphite Easy Bleaching (No. 1)	...	37.20 to 39.60
Sulphite News	...	38.20 to 39.20
Soda Unbleached (No. 1)	...	34.70 to 36.40
Soda Kraft	...	32.00 to 33.50

For moist mechanical there is little enquiry, and little business is reported by the importing agents in London, who feel the depression very keenly. Prices are low, but most of the mills are well stocked and sellers are abstaining from making contracts until the buyers offer a reasonable basis to make them on. From Scandinavia comes the news that mechanical there is dull and featureless, and stocks are well kept down. Prices are about as follows:—

Pine, 50 per cent. moist (unwrapped)	\$10.00 to \$10.60
Pine, dry	22.30 to 30.00

There is a good demand for practically all kinds of rags, but supplies are not too plentiful. Prices are firm and in some cases a slight advance has taken place. During the past month about 50 tons of rags were exported to Canada. Esparto is now arriving in fairly large quantities and prices continue on the same high level. Indeed, the tone of the market continues steady to firm, while enquiry is somewhat limited.

The chemical market is brisk. Sulphur is \$27.50 per ton, caustic soda \$48.50 for 77 per cent., and \$48 for 76 per cent. Soda crystals are \$9.60, and salteake \$9.90. Alum is \$28 to \$29 per ton, Bleaching Powder \$26 to \$28 (in softwood casks), and ammonia alkali about \$20, according to the package. Rosin is remarkably dull, and values are unchanged.

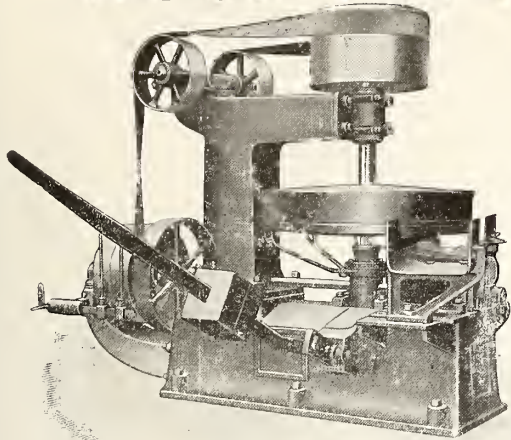
Fillings and loadings, such as china clay, mineral white gypsum, etc., are rather quiet just now, the depression no doubt being the cause of the slackness. China clay is being produced quicker than it can be sold.

The Canadian General Electric Co., Ltd., has issued an attractive booklet showing the Electric Hoists, Monorail Cranes, Grab Bucket Monorail Cranes, Electric Winches and Winding Drums. Lines are carried which are of particular interest to paper manufacturers and publishers.

Messrs. Griffiths, of Kingsway, London, have placed on the English market a self-toning paper for photographic purposes. The paper acts automatically and experts say that it will revolutionize the art of photography that is in the quick production of pictures. The paper is supplied in two grades, and men engaged in the photographic line and in the chemical line are speaking very well of it.

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TENDERS FOR WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Monday the 8th day of June, 1914, for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temiskaming.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues, including 40c per cord for Spruce and 20c per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate wood products mills on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into products thereof in the Province of Ontario.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted. For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,

Minister of Lands, Forests and Mines.
Toronto, Ontario, 24th April, 1914.



TENDERS FOR ALLAN WATER RIVER WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the 15th of July next for the right to cut ties from Spruce, Balsam, Banksian or Jack Pine, Poplar and Whitewood trees seven inches and upward in diameter two feet from the ground sufficient to supply a tie preserving plant for a period of twenty-one years from unoccupied, unsold and unlocated lands of the Crown tributary to what is known as the Allan Water River, tributary to the Grand Trunk Pacific Railway in the District of Thunder Bay.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the crown dues of \$2 per thousand feet board measure for anything not manufactured into ties, and for ties at the rate of 5c each, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

Such tenderers shall be required to erect within the limits of the territory covered by the right to cut ties, at some other place approved by the Lieutenant-Governor in Council a tie preserving plant.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for \$25,000.00, to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted. For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,

Minister of Lands, Forests and Mines.
Toronto, Ontario, 27th April, 1914.



SALE OF PINE TIMBER ON METAGAMI INDIAN RESERVE.

TENDERS will be received by the undersigned up to and including the 6th July next for the right to cut the Red, White and Jackpine timber over eight inches in diameter on the Metagami Indian Reserve, situate on the Metagami River in the District of Sudbury.

For particulars, descriptions, conditions, etc., apply to the undersigned.

W. H. HEARST,

Minister of Lands, Forests and Mines.
Department of Lands, Forests and Mines,
Toronto, 2nd May, 1914.

No unauthorized publication of this notice will be paid for.



TIMBER SALE.

TENDERS will be received by the undersigned up to noon of the 15th day of July, 1914, for the right to cut the Red and White Pine timber on berths 1, 2 and 3, Township of Blyth, in the District of Nipissing.

For maps and conditions of sale apply to the undersigned, or the Crown Timber Agents at Sudbury and North Bay.

W. H. HEARST,

Minister of Lands, Forests and Mines.
Toronto, May 4th, 1914.

Paper Mill For Sale

Under and by virtue of the powers contained in a certain Deed of Trust, which may be inspected at the offices of the British American Trust Company, Limited, Cotton Building, Corner Hastings and Cambie Streets, Vancouver, B. C., the undersigned intends to sell the following property:—

ALL AND SINGULAR, that certain parcel or tract of land and premises composed of a portion of Lot One (1), Group One (1), New Westminster District, being three and seven-tenths (3.7) acres of Lot seventy-three (73), according to Map 874, and more particularly described as that portion of the Shaw Lot, which lies between the Southerly Limits of the Vancouver, Westminster and Yukon Railway Companies' right-of-way and the left bank of the Brunette River, registered in the books of the Land Registry Office at the City of New Westminster, in the Province of British Columbia; and ALSO the plant of the Western Paper Mills, Limited, situate upon the said premises and consisting of a fully equipped paper mill in running order, operating a 92-inch 4-cylinder machine, situated on the line of the Great Northern Railway, near Vancouver, B. C. The mill has been in operation fourteen months, making Board, Sheathing and Wrapping Papers. The sale will include the undertaking and business of the said Western Paper Mills, Limited, and for such purpose tenders will be received up to and including the fifteenth day of July, 1914.

The highest or any tender not necessarily accepted.

For terms and conditions of sale apply to the British-American Trust Company, Limited, 198 Hastings St. West, Vancouver, B. C.

Dated this twelfth day of June, 1914.

BRITISH-AMERICAN TRUST COMPANY, LIMITED,

(Sgd.) W. L. GERMAINE, Director.

(Sgd.) N. HUMPHREYS, Asst.-Secretary.

Trustee

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By (Sgd.) J. F. GARVIN, Atty.,

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AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.**, the Timber Limits herein-after mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

License No.		Sq. Miles.
181	River St. Jean Br. East No. 1	22
"	" 182 River St. Jean N.E. Branch No. 2	18
"	" 183 River St. Jean East Branch No. 3	20
"	" 184 River St. Jean, No. 7	12
"	" 185 River St. Jean, No. 8	12
"	" 186 River Saumon & Tribut River St. Jean	34
"	" 187 River Magpie, No. 3	32
"	" 188 River Magpie, No. 4	32
"	" 189 River Magpie, No. 5	32
"	" 190 River Magpie, No. 6	32
"	" 191 River Magpie, No. 7	32
"	" 192 River Magpie, No. 8	32
"	" 193 River St. Jean, No. 1	24
"	" 193 River St. Jean, No. 2	24
"	" 194 River St. Jean, No. 3	23
"	" 195 River St. Jean, No. 4	18
"	" 196 River St. Jean, No. 5	20
"	" 197 River St. Jean, No. 6	20
"	" 198 River Magpie, No. 1	32
"	" 199 River Chambers, No. 1	56

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),

142 Notre Dame St. West, Montreal.

EUGENE TRUDEL (Messrs. LaRue & Trudel),

Edifice Dominion, 126 St. Peter St., Quebec.



TIMBER SALE

TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississauga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,

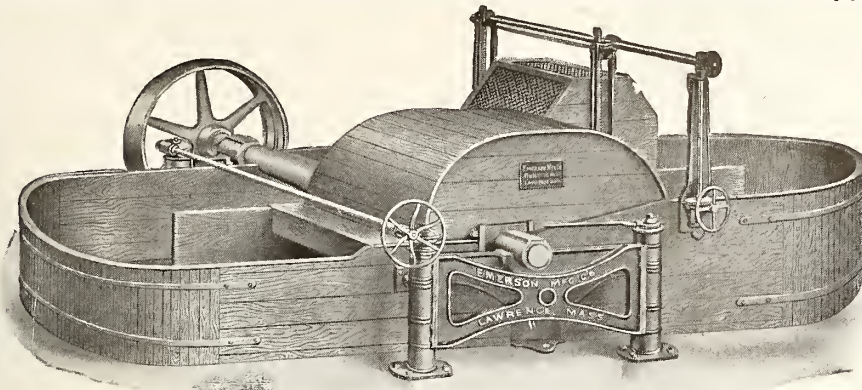
Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

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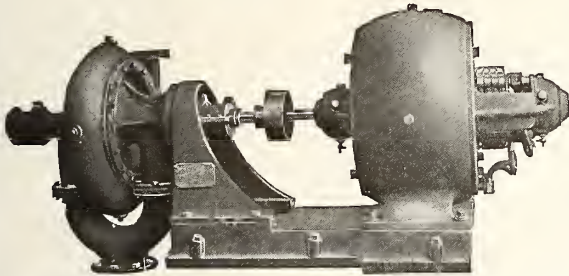
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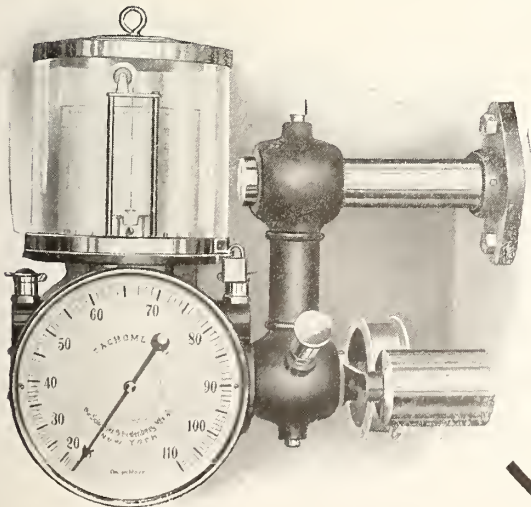
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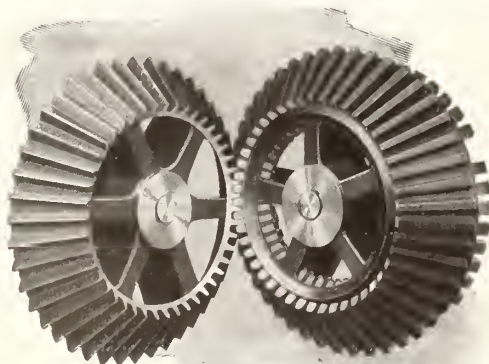
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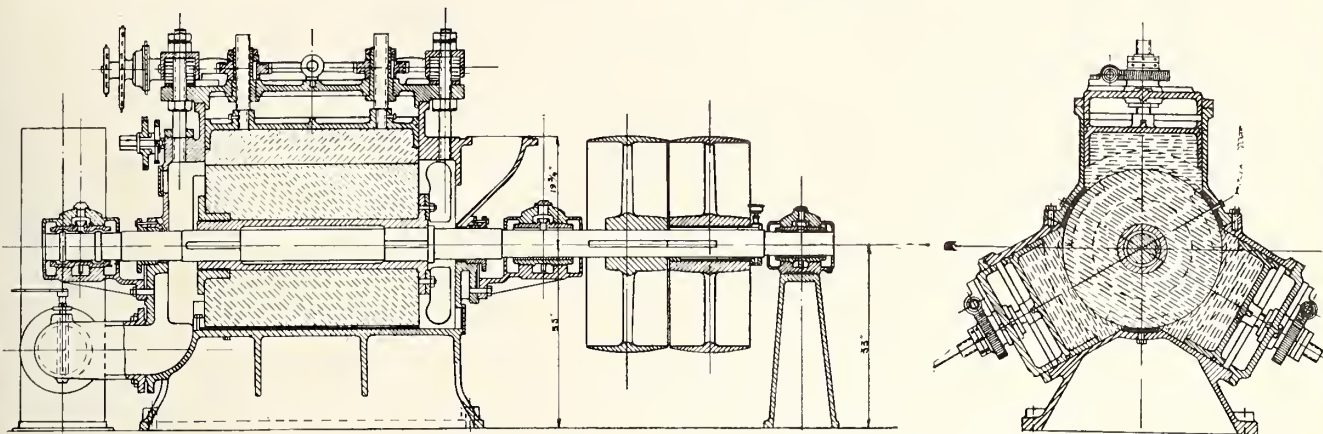
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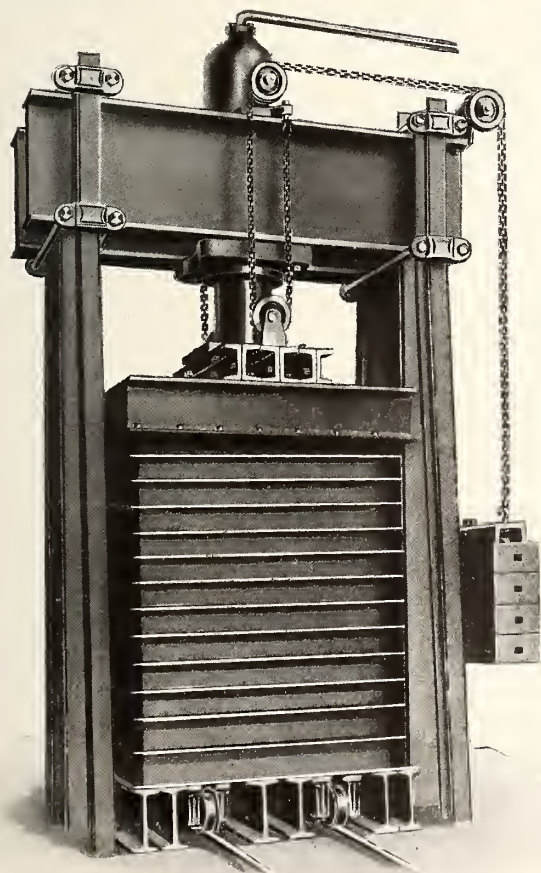
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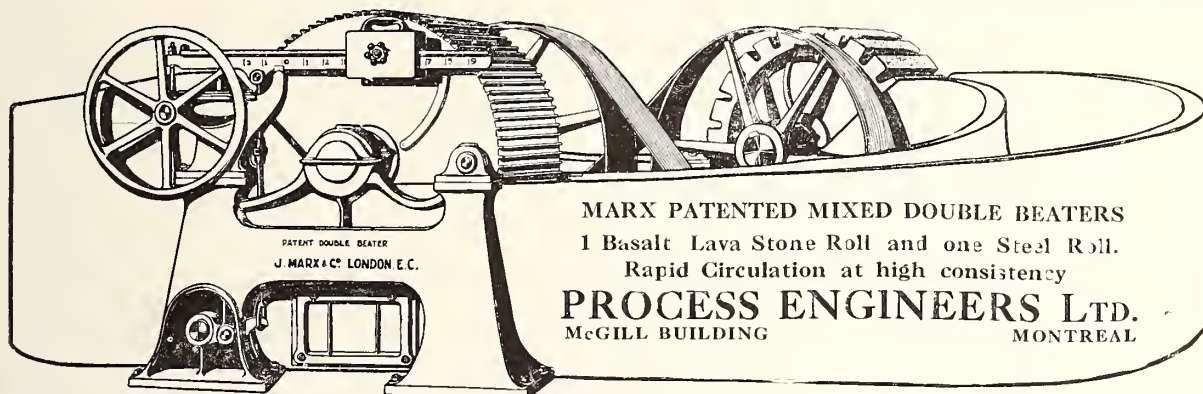
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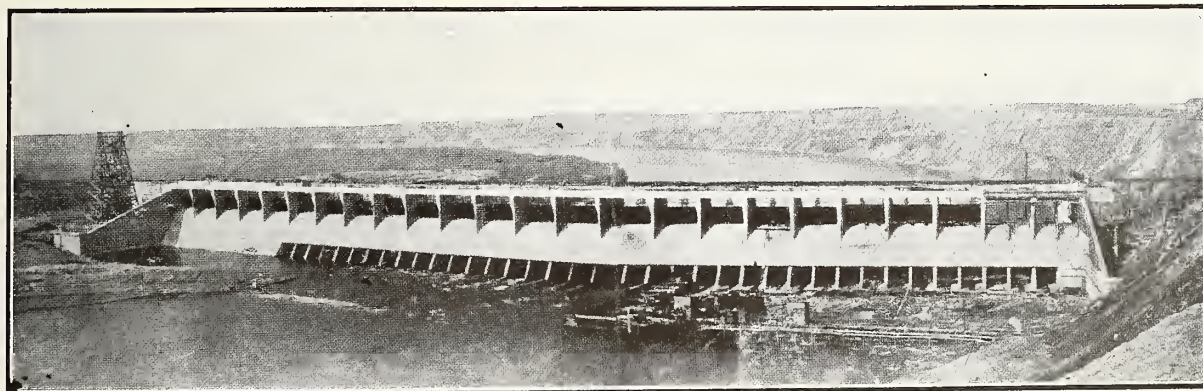
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- Air Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkes**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
- Belting**
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Reddaway, F. & Co., Montreal, Can.
- Belting "Camel Hair"**
Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Blowers**
Sherbrooke Mach. Co., Sherbrooke, Que.
- Boilers**
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Brass Wire Cloth, Fourdrinier Wires**
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calendar Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cas Silks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticizing Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet, A. P. & Co., Montreal, Can.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Clutches**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Silks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chip Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Gantry**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg. Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweller, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
- Digester Lining**
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Engineers Ltd., Montreal, Can.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Feeds**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Gravity Lowering Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

- Heating**
Sheldons, Ltd., Galt, Ont.
- Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.
- Knives**
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.
- Kollergangs**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Laying Machines**
Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.
- Motor**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.
- Presses**
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Beschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.
- Paper and Pulp Machinery**
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Beschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, I. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurttemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.
- Pneumatic Thickeners**
Sherbrooke Mach. Co. Ltd. Sherbrooke Que.
- Pneumatic Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbrooke Mach. Co. Ltd. Sherbrooke, Que.
- Press Wire Cloth**
Chambers Ltd., 152 Bay Street, Toronto.
Kutterath, Andreas, Marienweier, Germany.
- Pulp Stones**
Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England.
- Pumps**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co. Ltd. Sherbrooke Que.
Voith, J. M., New York, N.Y.
- Rags**
Walker, J. R. & Co., Montreal, Can.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alls**
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd. Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Tanks**
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works, Montreal, Can.
- Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Transmission Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto.
Jones & Glassco, Montreal, Can.
- Traveling Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Trolleys**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
 Canadian Allis Chalmers, Ltd., Toronto, Ont.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M. Co., Inc. New York, N.Y.
 Voith, J. M., Wurttemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis Chalmers, Ltd., Toronto, Ont.
 Hamilton, Wm. Co., Ltd., Peterboro, Can.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
 Christie, Geo., Ltd., Glasgow, Scotland.
 Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
 Kufferath, Andreas, Mariaweyer, Germany.
 Tippet, Arthur P. & Co., Montreal, Can.

Taylor, J. A., Montreal, Can.
 United Wire Works, Ltd., Edinburgh, Scotland.
 Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm. Co., Peterboro, Can.
 Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Machinery Co., Sherbrooke, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New-
 foundland.
 Basin Electric Light & Power Co., Ltd., Montmagny, Que.
 Beaver Co. Ltd., Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
 Booth, J. R. Ottawa, Ont.
 Bronson Co., Ltd., Ottawa, Ont.
 Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
 Colonial Wood Products Co., Ltd., Thorold, Ont.
 Campbell Lumber Co., Weymouth, N.S.
 Canada Paper Co., Ltd., Montreal, Que.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Compagnie de Pulpe de Dalmas, Dalmas, Que.
 Davy, James, Thorold, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
 Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
 Ford, J. & Co., Port Neuf, Que.
 Jacques-Cartier Pulp & Paper Co., Montreal.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 La Cie de Metabetchouan, St. Andre, Que.
 La Havre Pulp Co., Ltd., Bridgewater, N.S.
 Lake Megantic Pulp Co., Lake Megantic, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 MacLaren Co., Ltd., The James, Buckingham, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
 North Shore Power, Railway & Navigation Co., Clarke City.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
 Ontario Paper Company, Thorold, Ont.
 Ouiaichouan Falls Paper Co., Ouiaichouan Falls, Que.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Price-Porritt Pulp & Paper Co., Rimouski, Que.
 Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
 River-du-Loup Pulp Co., Ltd., Fraserville, Que.

Soucy, F. Florentine, Old Lake Road, Que.
 Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon
 Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
 St. George Pulp and Paper Co., St. George, N.B.
 Thorold Pulp Co., Ltd., Thorold, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Union Bag & Paper Co., Cape Madeleine, Que.
 Trent Valley Paper Mills, Glenmillier, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
 Dryden Timber and Power Co., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Quebec and St. Maurice Industrial Co., La Tuque, Que.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New-
 foundland.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Booth, J. R., Ottawa, Ont.
 Dominion Pulp Co., Ltd., Chatham, N.B.
 Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordan Pulp & Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and
 Sault Ste. Marie, Ont.
 Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson
 Bay, B.C.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
 Lincoln Paper Mills Co., Ltd., Merriton, Ont.
 Ford, J. & Co., Port Neuf.
 Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
 Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
 Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond,"
 "St. Lawrence Bond," "Canada Bond," "Burmese Linen
 Ledger," "Windsor Mills Special," "Silverstream," "Spring-
 vale," "Super Writing," "White Railway," "Railway Manila,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and
 Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book,"
 "Tinted Art Book," "Art Chromo," "English Book," "Satin
 Book," "Satin Litho," "Litho Label," "Super S. C. Book,"
 "Standard S. C. Book," "Windsor Book."
 Eddy Co., The E. B., Ltd., Hull, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Spe

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Montreal.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que., "Victor Printers' Blanks," "Superior Translucent Bristol," "C.P.C. Coated Litho," "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co., Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Miller Bros. Co., Ltd., Glenmiller, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B. Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverville, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," "Hercules Manila," "St. Francis Manila," "Wave Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers. her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood using industries apply to

Hon. W. H. Hearst

**Minister of Lands, Forests and Mines
Toronto**

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Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

MILLRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required. Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

WANTED—Experienced man for operating sheet cutter. Preference given to a man speaking both French and English. Belgo Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, P.Q.

FIRST-CLASS SULPHITE SUPERINTENDENT required for new mill under construction; state fully age, experience and salary required. Apply Box No. 85, Pulp & Paper Magazine, Montreal.

SUPERINTENDENT of experience wants position in mill making news, book, hanging, Manilla or specialties. Good on color and have good mechanical ability. References furnished.—S. W. K., Pulp and Paper Magazine, Montreal.

FOR SALE—A one-machine mill, doing good business, in first class running order, close to Toronto. Box 381, Pulp and Paper Magazine, Montreal.

FOREMAN MACHINIST.—Thirteen years' all-round experience in construction and repairs, specialised on paper mill repairs for six years, five years' foremanship, desires similar position. Box 87, Pulp and Paper Magazine, Montreal.

CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

WANTED—Four first-class Wet Machine and Grinder Foremen for new 200-ton Mill; state fully ages and salary required. Apply Box No. 86, Pulp & Paper Magazine, Montreal.

TECHNICALLY EDUCATED MAN, age 30; single; T.T.; holding highest diplomas given in England in papermaking; has taken advanced course in pulp and paper chemistry, six years' training under British expert in Kraft and pulp; experience in Britain, Norway and Finland; highest references; desires position as manager or assistant manager of Canadian mill, preferably after three months' time. Address "Canada," c/o Pulp and Paper Magazine.

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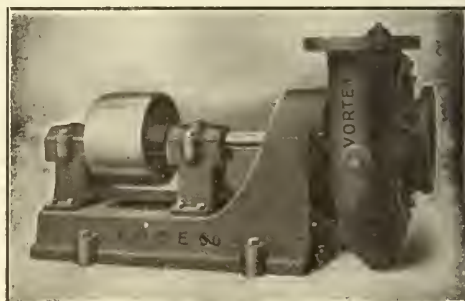
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AYERS LIMITED

 Lachute Mills
P.Q.

 Established
1870

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 For
Pulp and
Paper Mills

**LAWRENCE
PUMP &
ENGINE CO.**

 P.O. Box 70,
Dept. 10

**LAWRENCE,
MASS.**
**CENTRIFUGAL
PUMPS**

 We make an
exclusive
specialty of
High Efficiency
Centri-

fugal Pumps for Paper and Pulp Mill. In one mill 49 of our Pumps are running, the customer writes—"Your Pumps are all giving perfect satisfaction."

Telephone 1700 Broad
1701

Cable Address: "LAGERLOF NEW YORK"

Scandinavian-American Trading Company

PRODUCE EXCHANGE BUILDING - NEW YORK

IMPORTERS AND EXPORTERS OF

FOREIGN AND DOMESTIC

WOOD PULP

OF ALL KINDS AND

PAPER MILL SUPPLIES

HANS LAGERLÖF, PRES.

The HARMON INCLINE SCREENING SYSTEM

Will give greatest capacity
Will give cleaner stock
Will save power
Will save labor
Will not require use of Rakers

Write us for full descriptive Catalogue and
testimonials from the best mills in the
country.

Harmon Machine Company
Watertown, N.Y., U.S.A.

Glens Falls Machine Works

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Sole Manufacturers of

The ROGERS WET MACHINE
for Chemical Pulp

**TROMBLEE & PAULL ROTARY
SULPHUR BURNERS**

The MOORE ROTARY SCREEN
for Ground Wood Pulp

Improved STANDARD GRINDERS

Improved WET MACHINES

ROTARY PUMPS, Etc.

Write for Particulars and Specifications
They will interest you

F. N. McCrea, President
W. N. Munroe, Treasurer
J. A. Bothwell, Gen. Manager

EDWIN P. LINDSAY
Selling Agent
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Boston, Mass.

Brompton Pulp and Paper Company

Daily Production :—
320 Tons Ground Wood Pulp (Dry)
90 Tons Sulphate Pulp (Dry)
60 Tons Kraft Paper
LUMBER of all kinds :—
Clapboards, Shingles and
Pulpwood

MILLS AT
EAST ANGUS,
BROMPTONVILLE
and D'ISRAELI, P.Q.

Manufacturers of PAPER, PULP, LUMBER

Kraft and Fibre, Sulphate and Ground Wood, Clapboards, Shingles, etc., of every description in first quality.

TRADE



MARK

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Head Office and
Eastern
Warehouse:
READ BLDG.
MONTREAL
P.Q.

- Manufacturers of -
HIGH GRADE COATED
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PAPERS, also DULL FINISH
BOOK and BOXBOARD

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VALLEYFIELD
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Toronto

Western Representatives:

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Moose Jaw, and Saskatoon

TEES & PERSSE
of Alberta, Ltd.
Calgary and Edmonton

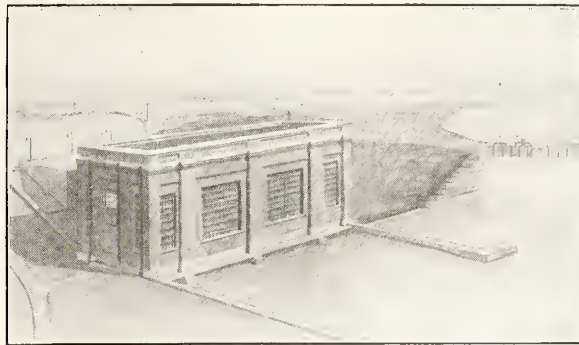
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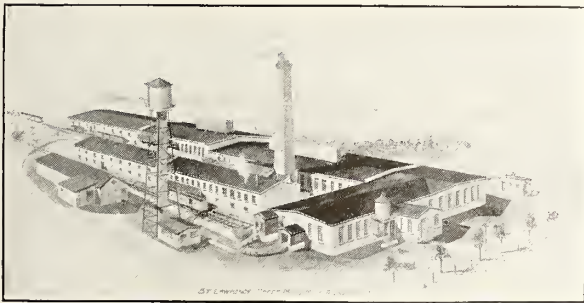
Barber Paper Mill, Georgetown, Ont.



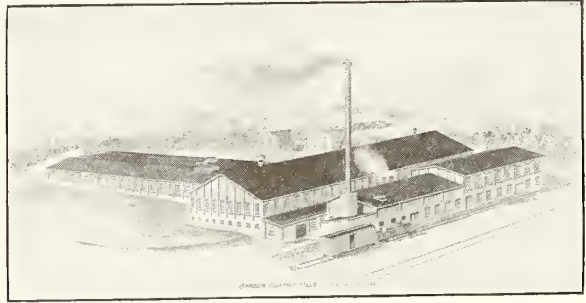
Montrose Paper Mill, Thorold, Ont.



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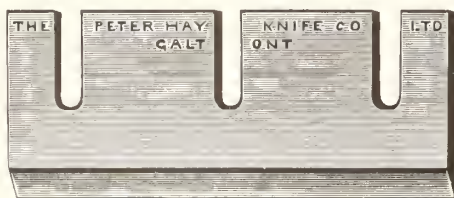
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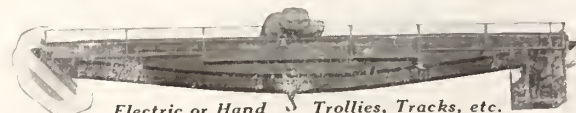
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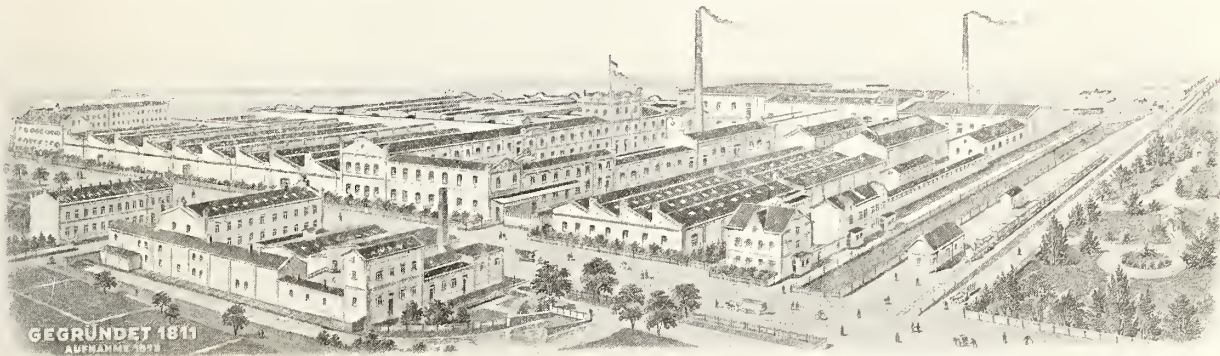
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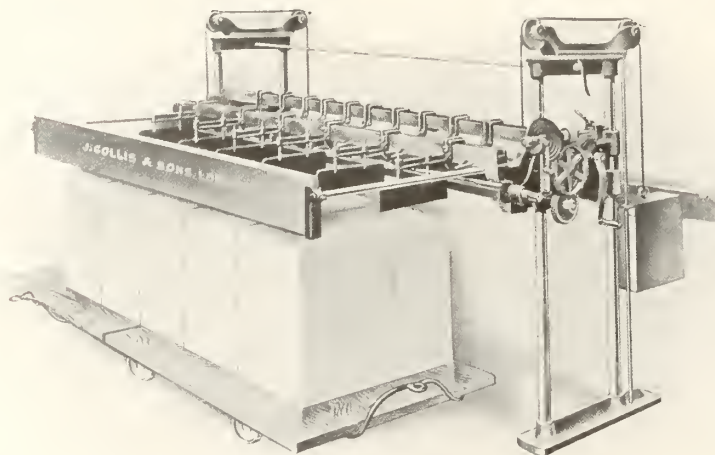
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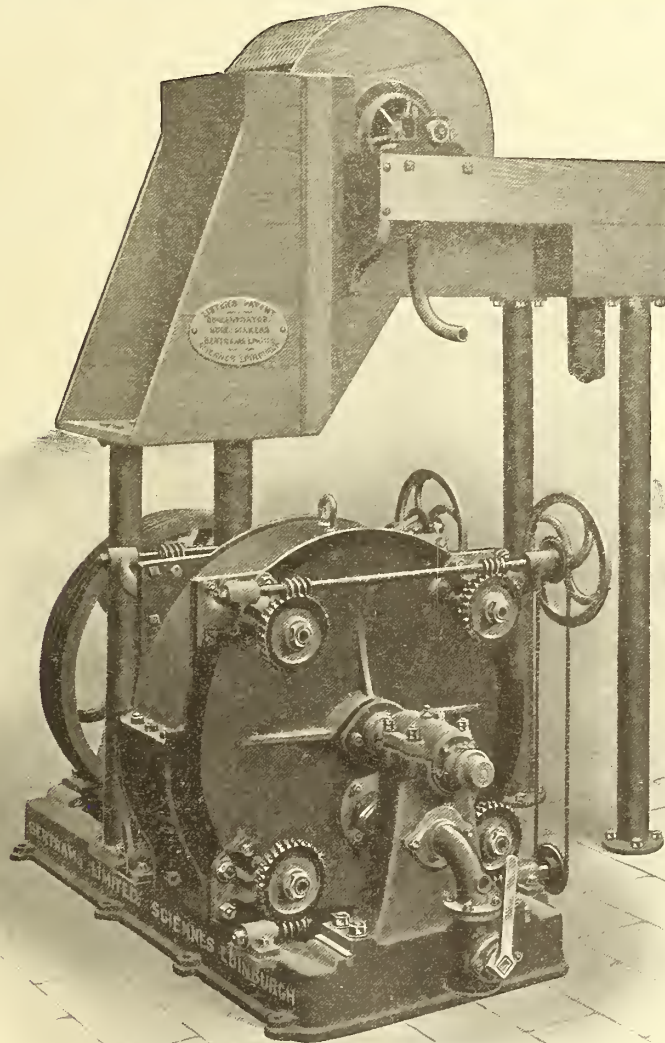
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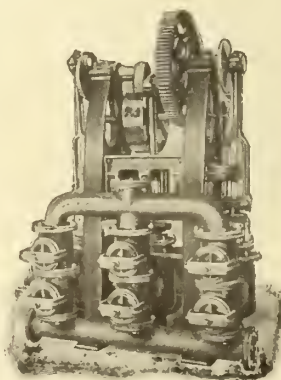
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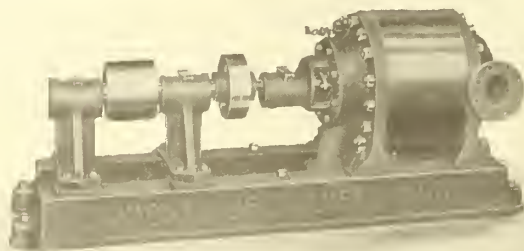
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PULP AND PAPER MAGAZINE OF CANADA

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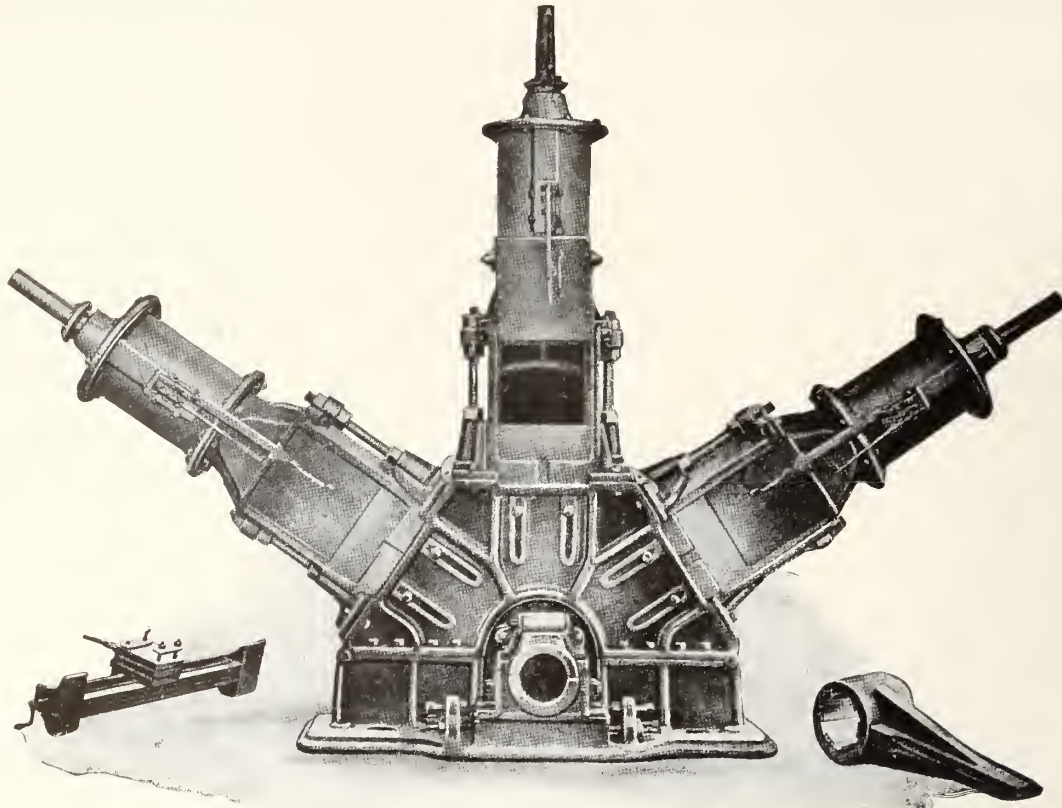
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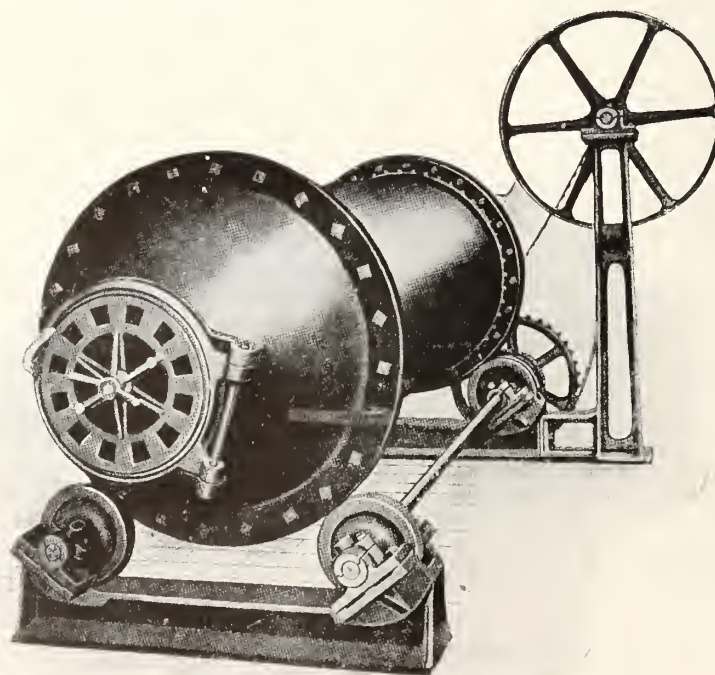
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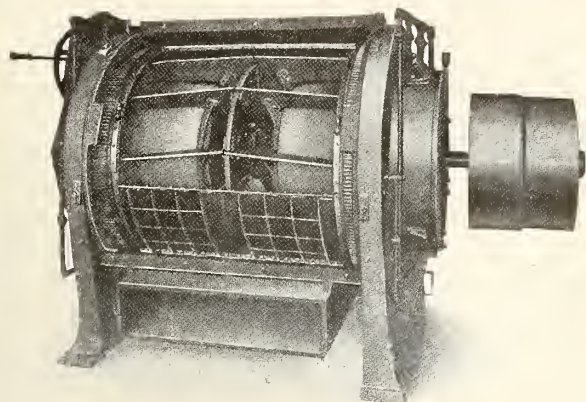
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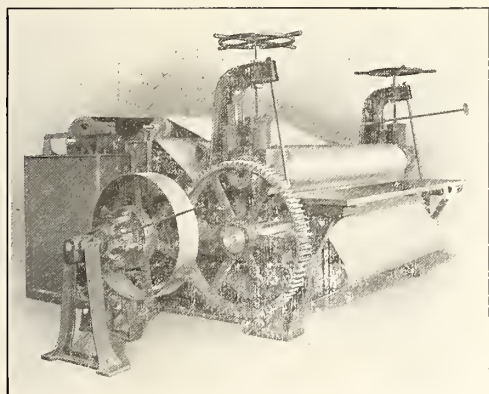
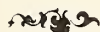
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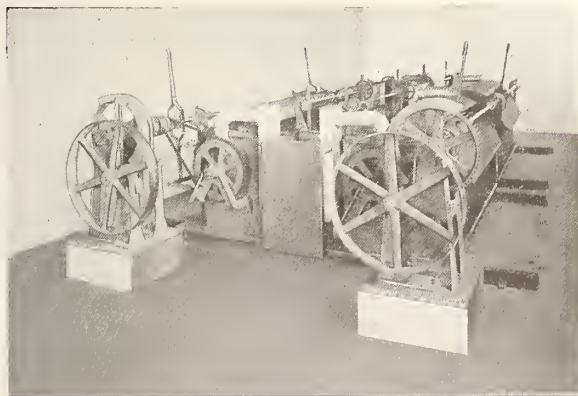
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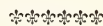


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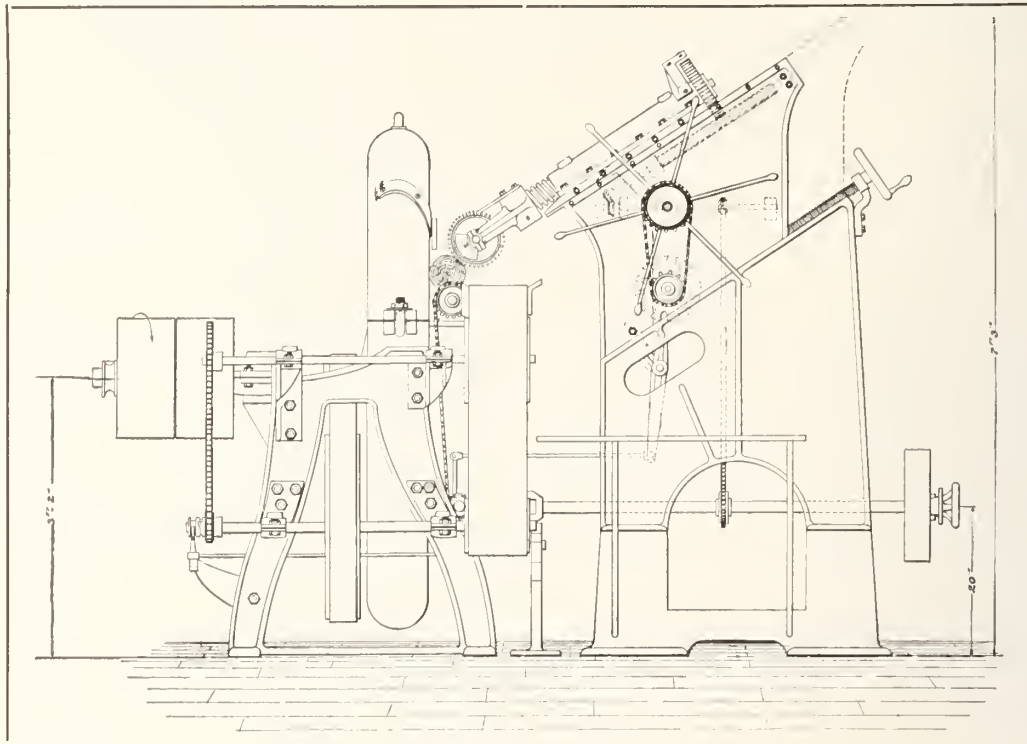
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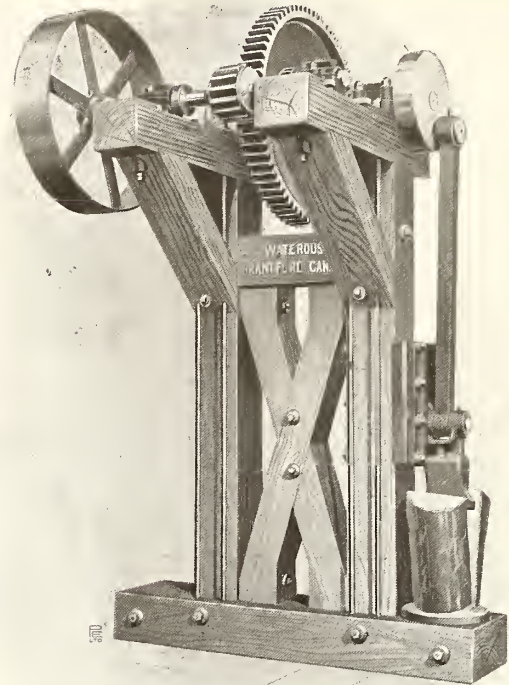
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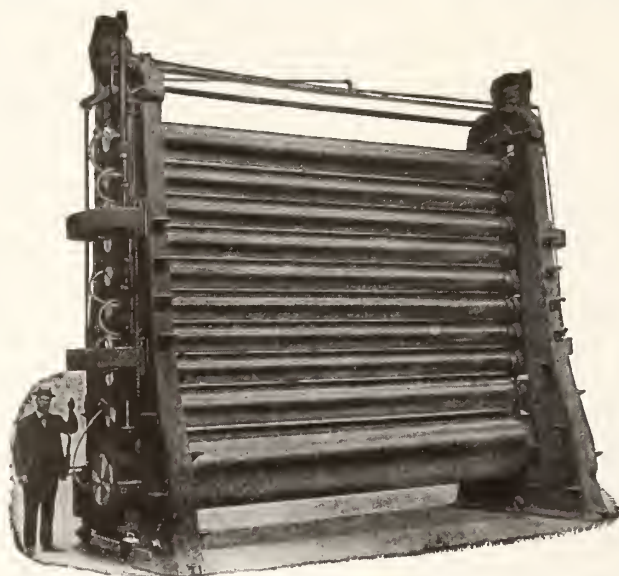
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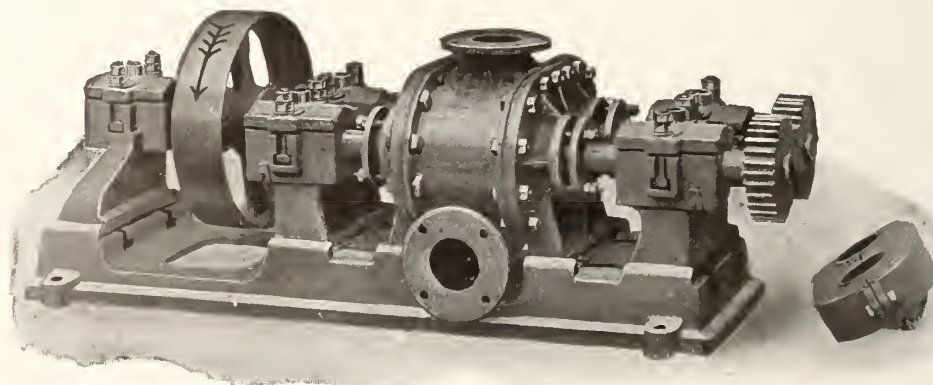


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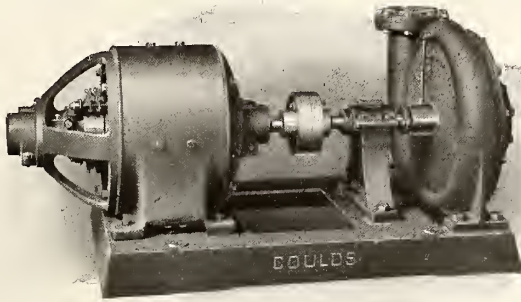


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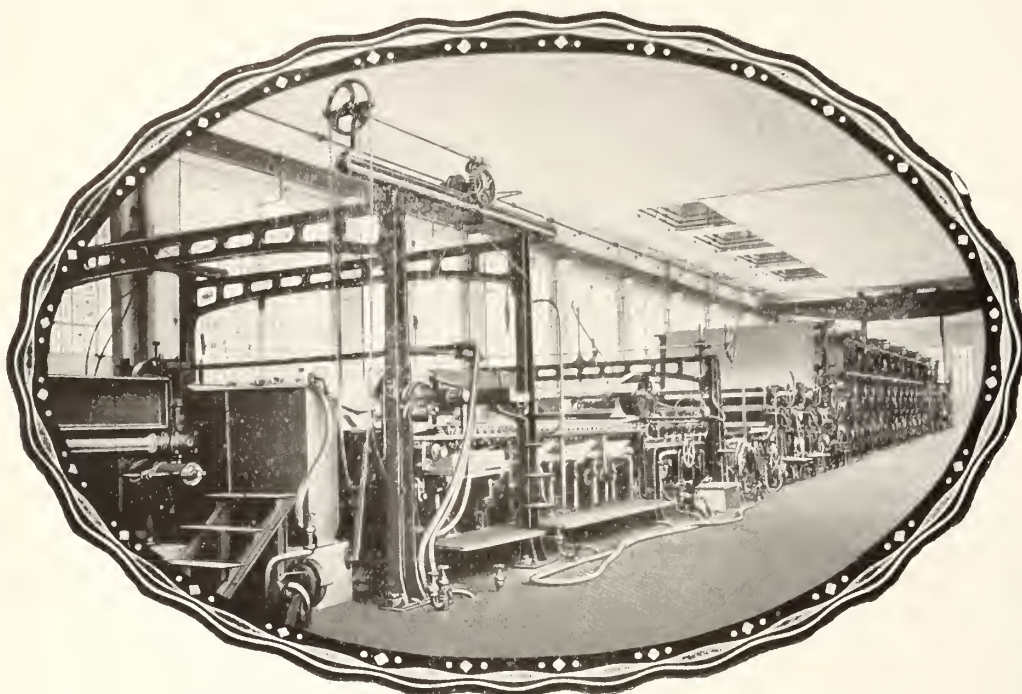
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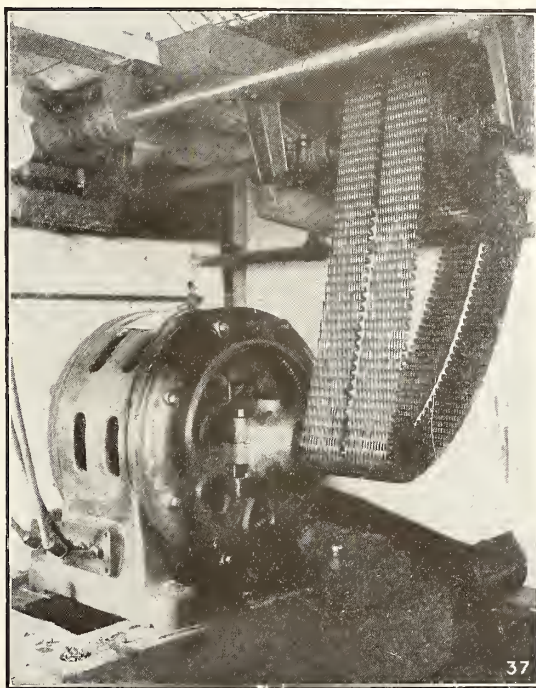
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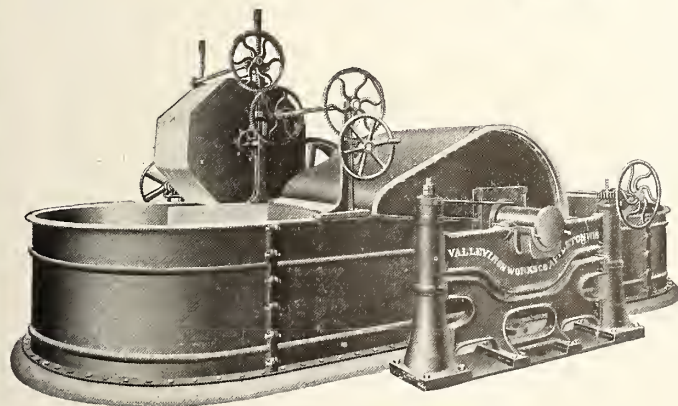
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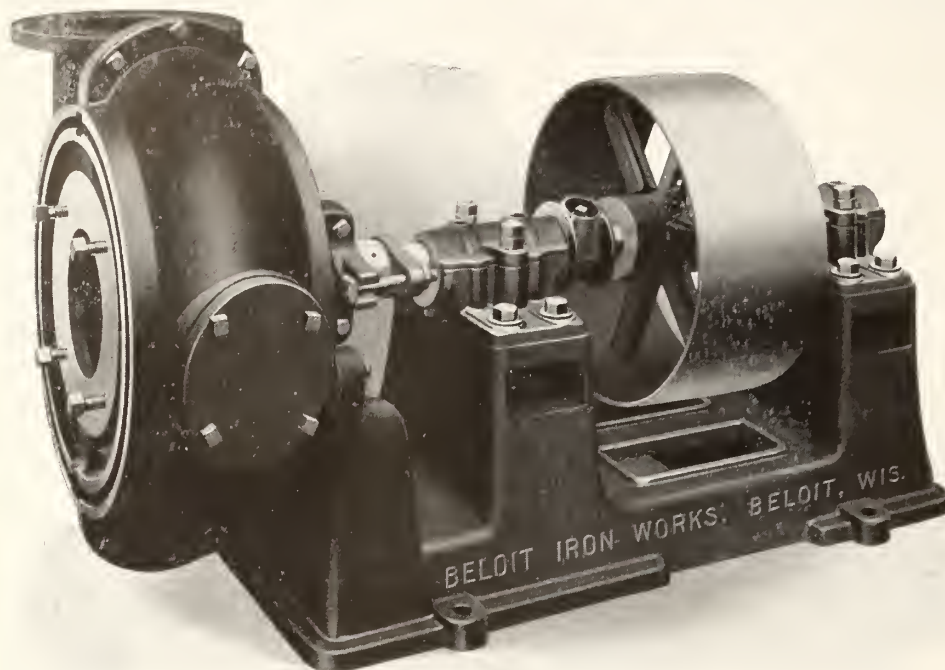
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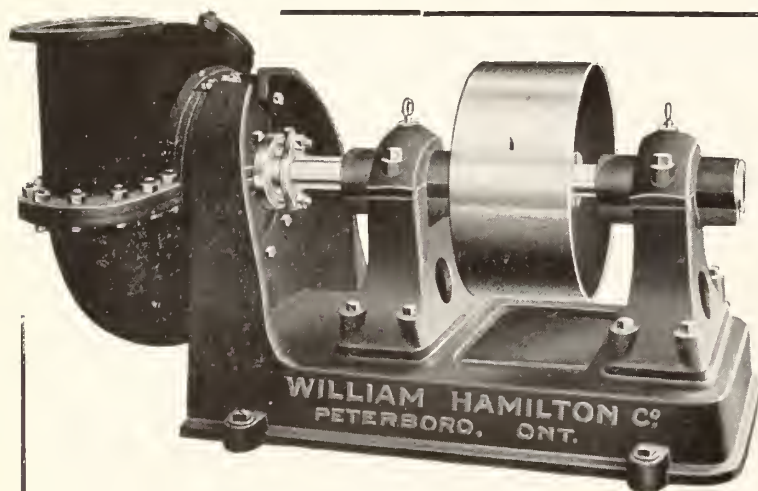
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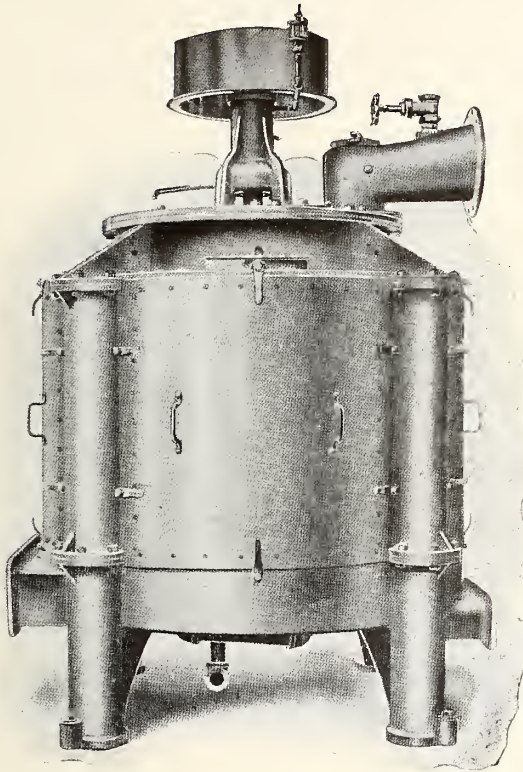
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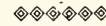
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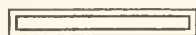
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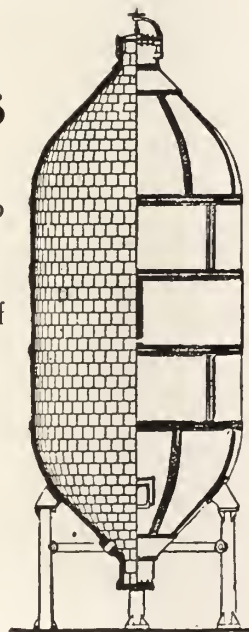
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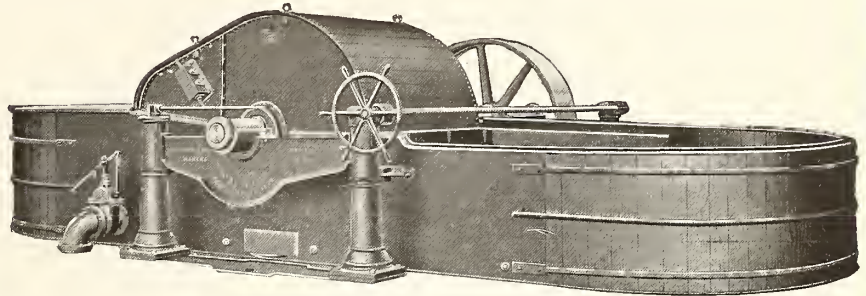


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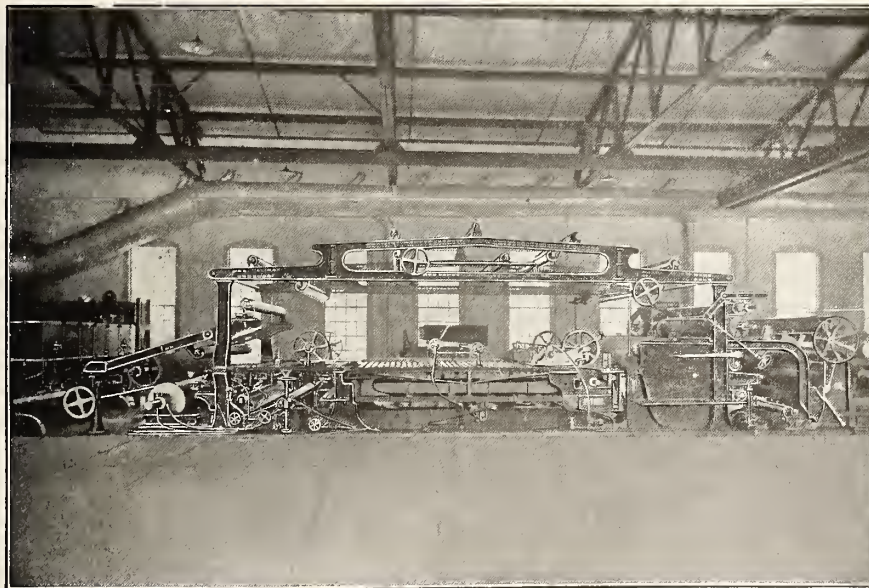


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No. 14

Natural Resources First

In this issue appear two interesting statements on the international situation in pulp and paper affairs. The one is from a director of large Canadian interests, made while he was in the United States. This latter fact makes it all the more interesting in our eyes. In his estimation, Canada stands on the threshold of a wonderful new development, and is destined to hold the premier place in the pulp and news print industry in America. The other is the complaint of an American protectionist, T. O. Marvin. The present Wilson tariff, according to him, is working the ruin of the United States mills.

Both statements may be a little strong. Canada undoubtedly has wonderful potentialities in pulp, and on the other hand the States are slowly, but surely, passing the zenith of their glory as pulp and paper producers. However these matters may stand, there is one main lesson for both countries in these descriptions of conditions: the United States manufacturers are in difficulties because they have meagre wood supplies and fitful water powers. Canada's hope lies in her abundant wood and her steady power. Not that Canada has ideal conditions by any means—far from it. Her forests have been ravaged by fire time and again, and vast areas to-day lie in black waste or slightly covered with saplings, because fires got headway. But considering population, wealth and scientific advancement, our friends to the South have gained their experience under most deplorable circumstances, and at terrible cost. In Canada we have still a chance to profit by what has transpired on the other side of the border. If ever there was a time when a nation needed to bend every effort towards the proper utilization of the natural wealth on which prosperity depends,

it is our country, and the time is the immediate present. This is a point which cannot be too strongly emphasized. The demands of the United States upon Canadian forests will never be less, there is a very strong probability that the next dozen years will witness an extensive exportation of Canadian pulp and paper to European and South American countries, and our own demands are due to increase with tremendous rapidity.

Forest fires, wasteful use and the locking up of ripe timber and pulp wood through insufficient knowledge or inadequate laws are to be ranked with the dissipation of a poor man's wealth. Canada needs her wood, and needs her water. She cannot have either without proper care of her forests. Canadian manufacturers and the Canadian public in general have a greater problem than they imagine on their hands.

Accurate Measurement

The time is passing when science is to be associated with musty book shelves, unintelligible formulae and mazes of apparatus. Nowadays, if the manufacturer does not know the ordinary basis of scientific investigation, he is indeed an exception. Science is sliding into every day life as naturally as mathematical calculations have entered into the forecasting of markets. It is only a question of degree, and happily the extent to which the scientific man and the man in the street are co-operating to their mutual benefit is a point of every day notice.

Indeed there is really no distinction between the practical man and the scientific man these days. Practically every move which is made in a manufacturing

plant is merely part of which some are pleased to call science. The work of the technical man is largely one of measurement and the necessity for proper standard for measurement, and for adherence to rules of manufacture as indicated by these actual measurements, is universal when we are getting so close in our industries to the point at which the profit ends and the loss begins.

In one department the need of statistical information is very easily seen. It is impossible to market a product unless the extent to which the demand goes is known, and it is difficult to attain regular and satisfactory profits unless the state of the stocks is apparent. The American Paper and Pulp Association has done a great work in acquainting its members with the state of the markets throughout the United States and in the whole world. If Canadian manufacturers are to share in the undoubted benefits which accrue from a well managed trade, it will be necessary for them to co-operate to the extent at least of our American friends to find out exactly where business lies. As is well known, European shippers have had such a poor knowledge of their markets in America that the same product has been sold at three different prices. This is a condition against which Canadians should guard. The Canadian Pulp and Paper Association has made efforts in the past and is still bent on the collection of statistics which will enable the manufacturers to see exactly where the best markets are, and the extent to which they can afford to produce without loss. To such an end the support of every manufacturer should be freely given.

Protests Against Tariff

The July issue of "The Protectionist" contains an article by Thomas O. Marvin which is bitter against the present administration.

"The intelligent and experienced correspondent of the New York Journal of Commerce summed up his account of the hearing on the paper schedule before the Ways and Means Committee with these words: 'All the evidence now developed goes increasingly to show that with reasonable efficiency paper can be made as cheaply in the United States as it can in Canada, no matter whether it is book paper or newsprint paper.'

"It was easy to get the Democratic members of the Ways and Means Committee to believe this, but the experience of the past few months has demonstrated that this pleasing fantasy has no basis in fact.

"If paper can be made as cheaply in the United States as it can in Canada, why is it that, with print paper on a free trade basis, the importations have increased threefold? If Canada cannot undersell the United States, why is it that practically all of the additions to paper mills during the last few years and almost all of the new mills constructed have been in Canada?

"Our importations of printing paper from Canada in the fiscal year 1911 were valued just under \$2,000,000; in 1912, they were \$2,101,000; in 1913 they jumped to \$5,646,000. During the first three months of the cal-

endar year 1913 we bought \$1,543,000 worth of printing paper from Canada. In January, February and March, 1914, we bought \$2,840,000 worth; half as much in the first three months of 1914 as we bought in the entire twelve months of 1913.

Canada was not in a position, when print paper was first put on the free list, to take full advantage of the opportunities which we had so generously afforded her; but as soon as she recovered from her surprise at our amazing action, she began to increase her manufacturing facilities in order to take advantage of the unexpected opportunity. More than \$150,000,000 of new capital was invested in Canadian paper mills within a short period after the free listing of print paper. The development of our own paper mills is at a standstill. Under free-trade legislation the growth of the paper industry is beyond the Canadian border.

"Our newspaper publishers expected great benefits from this legislation which they exerted every effort to place upon the statute books, but they are paying more rather than less for paper and have brought serious injury to American manufacturers and workingmen. At the present rate of importation more than \$12,000,000 worth of printing paper will be imported from foreign countries. This money will be sent from the counting rooms of American newspapers to the treasuries of German and Canadian mills. Not a dollar of it will be used to pay American wages or start the wheels in an American mill. It is money taken from Americans and spent with foreigners, and American newspapers will learn the witlessness of such a policy in shrinking returns and business depression. They will learn that legislation which favors a foreign industry and cripples an American industry will not appeal to the American sense of justice and that it does not accord with a wise and prudent national policy.

DUKE PAYS VISIT TO HARMSWORTH MILLS.

St. Johns, Nfld., July 13.—H. M. S. Essex, with the Duke of Connaught and party, arrived at Notwood this morning and was received by Governor and Lady Davidson, who had returned by rail from the West Coast and were acting host and hostess for Lord and Lady Northcliffe.

The Duke was escorted to the new Masonic Lodge at Botwell and the building has been named Connaught Hall in honor of his visit. Three Donaldson liners in port joined in the celebration.

At noon the Duke left by special train over the Harmsworth Road to Bishop's Fall, ten miles distant to inspect the pulp mills there. A warm reception was also tendered him by the officials in the Harmsworth mills, the largest in the world.

FREIGHT RATES INCONSISTENCIES.

Toronto pulp men are interested in a recent case of freight rate inconsistencies which has come to light. From Scandinavia to New York, a distance of four thousand miles, the charge on pulp is \$3.00 per ton, while from Thorold, to Toronto, a distance of less than a hundred miles, the rate is \$1.80 per ton. Further confusion and dissatisfaction arises from the fact that the charge on pulp wood from Anticosti Island to Thorold is about 30 per cent less than the water-and-rail charge from Anticosti to Niagara Falls, a little distance beyond Thorold.

CYLINDER PAPER MACHINES

By JOHN W. BRASSINGTON.

(Written Specially for Pulp and Paper Magazine.)

The Fourdrinier Machine, originally invented by a Frenchman, M. Robert, and developed by an English firm, Messrs. Fourdrinier, was in its first inception essentially a European product, although much of the perfecting of the design into the present efficient apparatus was due to human ingenuity on the American side of the Atlantic.

The cylinder machine, however, is essentially of the New World, both in the original invention and in the development and improvement of the same. The cylinder machine derives its name from the wire covered cylinder which performs the same duties as the wire of the Fourdrinier Machine. The manner of construction of the cylinder and its connection with the upper couch roll and the wet felt exclude the possibility of its being shaken sideways. The fibres will, therefore, only deposit themselves on the wire cloth in the direction in which the paper moves, that is, lengthways.

As we all know, paper made on a cylinder is in this respect inferior to that made on a Fourdrinier wire, which being shaken sideways causes the fibres to intertwine themselves in all directions. Cylinder paper has its strength in the direction in which it has traveled over the machine; it will split easily lengthways like wood, and with more difficulty across the grain.

Since it is impracticable to shake the cylinder, many ingenious arrangements have been designed with the intention of shaking or agitating the stuff, so that the fibres may be laterally deposited on the face of the cylinder.

Cylinder machines furnish an inferior paper, but they are cheaper and require less skill to operate than the Fourdrinier machine. The latter needs deckles, jackets, longer wires, and for the same weight of paper, requires more horsepower to drive. The diameter, and therefore, the wire surface of a making cylinder is limited, and the pressure of the pulp in the vat is the only means by which the water can be forced from it. Very heavy sheets cannot, therefore, be made on one cylinder, but if the paper from two or more cylinders is united on one wet felt, it will, after passing the presses and dryers, form a solid web. In this way with a multiplicity of cylinders, it is possible to make different thickness of board from different colored liners or fillers, in such combination as may commercially suit the market. It is to be noted that for the same weight of paper, the cylinder machine requires less horsepower to drive it than does the Fourdrinier; this fact is literally true, but it is to be remembered that for the heavier boards and papers, that of necessity pass slowly from the vats to the reel, that the corresponding torque at each intake shaft is largely increased in inverse proportion to the rate of the paper. It may be better for the machine owner and operator to remember that the horsepower required to drive a cylinder paper machine per foot per minute, is, on the average, three times as great as that required to drive a Fourdrinier machine at the same rate.

The apparent inconsistency between these two statements is reconciled when we remember that the average output per foot of speed of the cylinder machine is in the seconds of these assertions taken to approximate over three times the output of the Fourdrinier

machine at the same rate of speed. So, while the horsepower per ton of output is less in the case of the cylinder machine, when compared with the Fourdrinier machine, yet the pull of each belt on the pulleys of the intake shafts is often three times as great at any given moment on the cylinder machine than can be the case with the belts on the pulleys of the intake shafts of the Fourdrinier paper machine. The cause of the greater turning torque that sometimes obtains on the intake shafts of a cylinder machine is probably due to the greater thickness of the paper in the making; this thickness for the want of a better simile we might liken in its effect on the turning movement required to the effect on a wheel turning in the thick mud, as compared to one turning on a dry or slightly muddy road.

It is obvious, that although the cylinder machine is less complicated and mechanically speaking requires less skill to operate, that there is a much larger range of product and therefore, in a certain sense, a greater paper-making knowledge required. For instance, the thickness of the stuff may vary between wide limits, and the thickness of the board taken up by each cylinder will accordingly vary as the strength of the solution, and as the speed of the cylinder. The strongest board is made by a large number of cylinders giving a large number of ply to the same thickness of board. A thick board can be made on one cylinder by making the stuff thick enough, and at the same time, running the cylinder slow enough, but the quality of board so made is of necessity vastly inferior to board of the same thickness made in multi-ply by the use of a large number of cylinders.

We may as well interpolate here, that given a corresponding capacity in dryer surface, that the speed of output of the multi-cylinder machine is to the speed of output of the one cylinder machine, in proportion to the number of cylinders in the former.

The design of an efficient cylinder paper machine depends on the maximum and minimum thickness of board that is obtainable on one cylinder at the speed and output required. The slowest stock is boiled wood, that is, boiled wood board cannot be made as fast or as thick per cylinder as any other stuff. Mechanical ground wood, pulp board, or straw stock containing the lignine, the intercellular or more fibrous vegetable matter is always slow stuff. The fastest stuff is sulphate; therefore, thicker board can be picked up in less time on a single cylinder of this stock than of any other. Between the extremes, we have soda pulp, old newspaper and straw pulp treated by the soda process. It is apparent from the above that a considerable range of experience is necessary to obtain the maximum output from any given machine by using the proper percentage of water in the stuff for every kind of stock that may be in use.

The use of the making board and the proper placing of the agitators is of primary importance. The writer was told one day by a gentleman whose name stands high as a paper machine designer (Mr. V. G. Hazard) that many years ago, when starting up a cylinder machine, that was using a wool and shoddy stock for making carpet lining paper, that the greatest difficulty was encountered in getting the stuff to form on the cylinder.

der. The stock was so light and so fluffy that it floated to the top of the stuff in the vat and refused to form regularly on the cylinder. The machine tender becoming impatient, took up the hose and asserting his intention of washing off the forming cylinder, turned the water on full force into the vat. The jet of water struck the cream or foam of stock on top of the vat before it struck the cylinder, and the result was to the delight of the bystanders, that a beautifully formed sheet of paper appeared at once on the forming cylinder. As a light stock will float, so also a heavy stock will settle, so it is evident that the best design of cylinder vat provides for the maximum of agitation; a corollary of this thought is that the stronger the agitation, the more interfluent the fibres, and therefore, the stronger the formed paper.

A little thought will soon convince that the question of the direction of the flow of the stuff with respect to the direction of rotation of the forming cylinder is apparently dependent on the specific gravity of the stock in use; a heavy quickly settling stock should be circulated to be successful against the direction of the forming cylinder; in the case of a light fluffy stock, prone to float if undisturbed, the forming cylinder should tend to draw it under the water; the direction of rotation of the forming cylinder and of the flow of the stuff being concurrent. If, however, proper agitating devices are used, the direction of rotation of the forming cylinder with respect to the direction of flow of the stuff is not of primary importance.

One of the best forms of agitation is obtained by figuring the inlet small enough for the stuff, so that the speed of entry of the stuff must be great in order to allow the machine to make its output; this puts it out of the power of the machine tender to partially spoil the strength of the product, and also form deposits of heavy stock in the vat by too little agitation. One of the most important items of the many that tend to the successful operation of a cylinder paper machine is that the machine tender should believe, and that his superior officer should believe, in the mystic effect of the machine tender's own personality on the output of the machine; given this belief in both parties, and the tender will do his best to obtain a record output each day, but if this belief fails in either to the knowledge of the tender, than all the good points characteristic of the machine itself will not save it from condemnation. Talking of machine tender efficiency reminds the writer of a story of a machine tender who lost his job because of intemperance. Getting home after his discharge, he sent his little boy to the mill for his personal belongings; he also gave the youngster a mud turtle to drop in the cylinder vat in as unobtrusive a manner as possible. Mr. Mud Turtle, true to his instincts, was never in sight when anyone was around, but he was very busy at other times, trying to climb that cylinder. To everybody's disgust, no one could make the "confounded" old machine work, so it was necessary to send for the discharged one who promptly proved his ability by surreptitiously removing the mud turtle, and everything went as smooth and as bright as wedding bells; all this tends to show how necessary machine tenders are when there are no practical brains in the office.

The problem of arranging for the proper capacity of the dryer nest for any given output of a cylinder paper machine, is somewhat different to the parallel case of a Fourdrinier machine, because the board on a cylinder machine arrives at the first dryer with a larger percentage of water in it than is the case with

the paper on a Fourdrinier machine. While the paper on a Fourdrinier machine may arrive at the receiving dryer with only 60 per cent. by weight of water, the board on a cylinder machine may arrive at the similar place with from 75 per cent. to 80 per cent. of water. The difference between drying a thick board containing a high percentage of water as compared with drying a thin paper with a relatively low content of water, is obviously large, and the methods adopted as the result of experience seem to show that a high temperature at the press end of the dryers is preferable in the case of a board machine; this is the reverse to the conditions that seem most suited to a paper machine as far as the writer's knowledge goes. It is apparent that the formation of steam in a board on the inside, before the outer layer of the board is dry, and therefore, permeable by vapor, is deleterious to the quality of the board, and this is evidently a condition obtainable only by high temperatures and pressures; for this reason it is good practice in the dryer nest of a board machine, to maintain the relatively higher pressures at the dry end of the nest.

In conclusion, it is curious to note that the output per inch of width of a cylinder machine that has the proper number of dryers, is somewhat less than the output of a Fourdrinier machine, also properly equipped. The reason for this discrepancy is beyond the analytical capacity of the writer, and is only stated here as the apparent result of reasoning based on the law of averages, as applied to the records available to him. While the following figures are not necessarily correct for all cases, yet they are of sufficient accuracy and interest to warrant the attention of the reader, being based upon probably the largest collection of authentic data on paper machines now in the possession of anyone.

Let us assume that W = the width of any paper machine in inches, that W^1 = the weight of the paper made in pounds per ream of 480 sheets 36" x 24", that F = the speed of the paper in feet per minute; then a Fourdrinier machine making 30-pound paper at 600 feet per minute of 150" wide, will have a daily average output of $W \times W^1 \times F \times 19 \times C = 51.3$ short tons.

In the case of the cylinder machine, using the same symbols and the same constant (C) which really only places the decimal point we have $W \times W^1 \times F \times 17 \times C = 45.9$ short tons.

In order to make a comparison and illustrate the point, it is necessary to use absurd figures when referred to the cylinder machine. Applying the same formulae to 140 pound paper, which is about the thickness of the average postcard, and assuming that it can be made at 150 feet per minute on either machine; then the output of the two is as follows, basing our conclusions on empirical data:

The Fourdrinier = $150 \times 140 \times 150 \times 19 \times C = 59.85$ short tons.

The Cylinder = $150 \times 140 \times 150 \times 17 \times C = 53.55$ short tons.

These figures, possibly, show that the average cylinder machine is not operated as efficiently as the average Fourdrinier machine, either because of poorer development of design or of inferior adeptness of operation. It is hoped that the reader will apply the above empirical formulae to any actual case with which he is acquainted, and having done so, will let the writer know his conclusions together with any concurrent facts that bear on the result. It is only by pooling our knowledge that we can efficiently help one another.

THE CHEMICAL EVALUATION OF WOOD FOR PULP

By MARTIN L. GRIFFIN.

At a meeting of the Maine Section of the American Chemical Society held in Bangor, October 17, 1913, I showed the inadequacy of the cord measure as a unit for valuing pulp wood, resulting in great variation in the solid volume, due to various factors. As a better standard I advocated a solid unit, namely the cubic foot, and illustrated how such a unit could be adapted in practice without inconvenience. I also advocated a unit of weight as a still more reliable basis. There remains the valuation according to the amount of fibre wood will yield, which is the chief concern of manufacturers of chemical pulps.

To make effective any of these units as a basis for evaluating wood for pulp we must resort to an efficient system of sampling which will be truly representative. Such a system was described in my former paper.

The great need of such a basis for valuing wood is at once apparent when we stop to think of the great variation in the quality of the same species, depending upon its habit and conditions of growth. Poplars of our northern states differ greatly from those of the middle southern states. The measurement of value by cord or solid contents takes no account of yield in pulp. Other species of similar external characteristics are often mixed in, as Bass wood with Poplar, and Fir and Hemlock with spruce. Such mixtures in late years have been permitted, when the characteristics are near enough to cause no trouble in cooking. Aside from these differences in species, and habit of growth, there is the quality of the wood, as such, which should be taken into account in its bearing on yield of pulp. Wood is subject to disease and decay and all such defective wood will not give the normal product.

With a view to discovering the influence of these various factors upon the yield, a large number of determinations of the cellulose were made by the Cross and Bevan chlorination method.

The procedure was as follows:—

The stick to be tested was quarter sawn, and the sample was obtained by planing thin shavings from the face of the quarter. In this way the sample would include a part of the growth from the center to the bark. We found such thin shavings much more satisfactory than any other form.

Three grams of the shavings, previously dried at 100 deg. C., were boiled for about half an hour in 1 per cent sodium hydrate. The mass was then well washed and squeezed and placed under a bell-glass, into which a slow stream of chlorine gas was led. Complete conversion of the lignone will usually follow in one hour's exposure to the gas. It is then well washed to remove hydrochloric acid and impurities and placed in a two per cent solution of sodium sulphite containing two tenths of a per cent of sodium hydrate, and boiled for about five minutes. The fibre is then well washed with hot water, and this treatment with sodium sulphite and hydrate repeated if found necessary. It will be found almost pure and nearly white; but to remove the last residues of non-cellulosic matter, it may be bleached with hypochlorite or permanganate. If with the latter, it will be necessary to wash with a weak solution of sulphurous gas. It is then dried, weighed and results calculated.

The following table gives the characteristics of 24 samples of mixed spruce and balsam fir from Montmorency in Canada.

MONTMORENCY WOOD TEST

NOVEMBER, 1912

Kind of Wood	Moisture %	Weight of one C'd		Area in one Cord		Volume in one C'd		No. of Sticks in One Cord	
		Wet	Dry	Solid sq. ft.	% Solid sq. ft.	Solid cu. ft.	% Solid cu. ft.		
4 ft.	24.44	3014	2277	24.22	75.70	96.88	75.70	80	From Pile behind Platform. Standard Wood
"	31.00	3313	2286	23.60	73.75	94.40	73.75	109	From Pile on Platform. York's Standard
2 ft.	40.1	3990	2392						2 ft. Wood from Large Pile
"	43.3	3992	2220						"
"	38.4	3636	2240	49.4	77.2	98.8	77.2	178	"
"	38.4	3616	2228	48.5	74.8	97.0	74.8	185	"
"	48.7	4395	2140	51.65	80.8	103.3	80.8	210	"
"	48.7	4255	2075	51.15	79.8	102.3	79.8	184	"

The samples were selected to show the various factors influencing the yield in chemical fibre. Eight of these samples were chosen from wood of recognized good quality for comparison. From a review of the table and the samples we observe first—that density of annual ring growth is not necessarily proportional to specific gravity. Note numbers 9, 1, 7, 23, 24, and that specific gravity is not proportional to yield of fibre. This latter is also shown by numbers 2, 8, 21 and 22, where yield is fairly regular and specific gravity is irregular. This would indicate, as we would suppose,

that habit and environment have much to do with the quality of wood.

Second—We can establish very well, the influence of incipient decay upon the yield by reference to Nos. 12, 17 and 18, all of which are sound specimens and comparing these with Nos. 3, 4, 5, 6, whose annual ring growth will compare favorably and the specific gravity and yield are noticeably low.

The most important conclusion of all and the one we are perfectly safe in drawing is that there is great variation in the yield of chemical pulp, and that some

consideration should be given to this yield in fibre in valuing wood for pulp.

The yield per cord is found by taking the solid volume which I find to be about 100 cu. ft. and multiplying by the specific gravity. This will give the cord weight basis from which the yield in fibre can be calculated.

The volume yield is found by multiplying the specific gravity into the percentage fibre yield.

The specific gravity of wood is very quickly determined approximately by displacement in mercury instead of water. A small piece of the wood is weighed, a pin stuck into it, and immersed in mercury contained in a small graduate cylinder, when the volume displaced can be read off directly.

The following table shows the weights of the cord of mixed spruce and balsam fir containing different percentages of moisture and the dry weight, which averages about 2,200 lbs., free from moisture.

LABORATORY TEST OF MONTMORENCY WOOD
NOVEMBER, 1912

No. of the Sample	Kind of Wood	DESCRIPTION OF SAMPLE	Diam.	Rings per Inch	Sp. Gr. of the Wood Dried at 100°C	YIELD			Solid ft. per Cord
						% by Weight	% by Volume	Lbs. per Cord	
1	2 ft.	Sound, fine grain	10"	23.3	.4700	51.6	24.2	1515	100.3
2		Sound, fine grain	$\frac{1}{2}$	21.4	.3522	51.5	18.1	1132	
3		Dead Wood, medium course	$8\frac{1}{2}$	14.1	.3697	49.5	18.3	1144	
4		5" of centre dry rot well established	9	13.1	.3535	47.2	16.7	1045	
5		4" of centre dry rot, poor	10	15.6	.3518	52.3	18.5	1157	
6		4" of centre dry rot, very poor	8	15.4	.3474	48.2	16.7	1045	
7		Fine grain, slight indication of dry rot surface	$8\frac{1}{2}$	24.4	.4141	52.8	21.9	1370	
8			8	19.2	.3076	53.5	16.4	1026	
9		Sound, very coarse grain	7	6.8	.3475	55.2	19.0	1189	
10		Coarse grain, slight indication of dry rot surface	8	10.7	.3365	54.1	18.2	1139	
11		Sound	$7\frac{1}{2}$	12.7	.3242	53.9	17.5	1095	
12		Coarse grain, sound	5	16.2	.3166	52.1	16.5	1032	
13	4 ft.	Dry rot and dead throughout, poor	7	16.3	.3469	41.6	14.4	901	95.64 York's Standard
14		Coarse grain, dry rot well established throughout	$5\frac{1}{2}$	10.2	.3242	47.2	15.3	957	
15		Coarse grain, sound	8	12.0	.4094	54.0	22.1	1383	
16		Coarse grain, dead wormy	5	12.5	.3347	49.2	16.5	1032	
17		Medium fine grain, sound	$5\frac{1}{2}$	15.3	.4011	55.0	22.1	1383	Another Standard
18		Coarse irregular grain, dense, sound	$8\frac{1}{2}$	12.9	.4333	54.5	23.6	1477	
19		Coarse, grain rather light, sound	$7\frac{1}{2}$	12.0	.3556	56.1	19.9	1245	
20		Coarse grain, sound	9	12.0	.4291	57.2	24.5	1533	
21		Fine grain, sound	$7\frac{1}{2}$	19.7	.3597	53.0	19.1	1195	Another Standard
22		Fine grain, sound	7	18.2	.3657	51.6	18.8	1178	
23		Very fine grain, dense, sound	$10\frac{1}{2}$	24.0	.3391	57.5	19.5	1220	
24		Very fine grain, light, sound	6	23.0	.3368	59.0	19.9	1245	

Comparing the square foot cross section of a cord of two feet and four feet woods, we observe that the former is about 50 or 78 per cent, while the latter is about 48 or 75 per cent, showing that the voids in two feet wood are less than in four feet wood. Comparing the solid cubic feet we find it to be about 100 in the case of two feet wood and 95 in four feet wood.

From experiments not shown here, it has been proven that large wood contains more solid wood per cord than small sizes, in the ratio of about 96 to 92.

From these results it is apparent how important it is to the manufacturer of chemical pulp to know what his wood will yield and for his purposes, it should be valued accordingly. Progress in valuing wood in any other way than by the cord unit will be slow. First because all timber having a dimension lumber value will necessarily be valued by dimension. Second—as wood finds various markets, it will be valued according to the use it is put to in the highest market and the tendency to value all wood by the unit measurement of the principal market will persist. Meanwhile conditions are rapidly changing whereby the poorer grades of wood only are finding their way to the pulp mills and the question of supply and demand are determining factors.

So far as I know, manufacturers of pulp have done little or nothing to promote a better standard of valuing wood for their uses and we may expect no change until they take this matter more seriously in the interest of more efficient management of their plants.

WEDDING BELLS.

On June 30th, Mr. A. G. McIntyre, former superintendent of the Dominion Forest Products Laboratories and Editor of the Pulp and Paper Magazine, now manager of the pulp mill of the Bathurst Lumber Co., at Bathurst, N.B., was united in marriage to Miss Josephine Clarke, daughter of Mr. and Mrs. W. G. Clarke, of Bear River, N.S. The wedding was solemnized in the Baptist church at Bear River, by Rev. W. E. McIntyre, father of the groom. Mrs. Howard Cunningham and Miss Nan Clarke, sisters of the bride, were matron of honor and bridesmaid, respectively, and Mr. Archie McDiarmid, of Montreal and Bathurst, supported the groom. Mr. and Mrs. McIntyre went immediately to Bathurst, where they will take up residence.

CANADA'S POSITION IN THE PAPER INDUSTRY

Paper Trade Journal Publishes Interview With Prominent Canadian.

Canadian pulp and paper manufacturers take a rosy view of conditions, present and future, in the Dominion. An interview with a director of four pulp and paper plants, and an active figure in the Canadian industry, makes plain the fact that the Canadians are fully alive to their possibilities. The views and statements presented, however, are of course those of the gentleman interviewed, and must not be considered as an expression of opinion by the Paper Trade Journal.

The international situation influencing the future of the great news print industry in Canada continues to develop points of importance. Although few conversant with the condition of the Canadian paper market at the present time may feel elated by immediate prospects, the fact remains that the general course of events in this country and the United States is playing strongly into the hands of Canada, and warrants the keenest optimism.

A survey of the news print mills in the United States and Canada, and some knowledge of the annual reports presented at recent meetings brings out a fact of the most vital significance. Those United States mills which have been far-seeing enough to acquire abundant pulp wood limits, and are equipped with plenty of water power which they can afford to use for mill purposes, and which happen in addition to be blessed with facilities for cheap water transportation, are making some money, and probably will continue. But there are numerous other news print mills, the directors of which face a perplexing situation. First of all the abolition of the tariff imposts on cheap papers has encouraged Canadian mills to load the American market with 1,000 tons of news print paper per day. That enormous and increasing importation means a lowered demand for United States products, a position which the paper mill owner south of the border faces with a degree of helpless amazement, and however reasonable and emphatic his protests to Washington may be, the ear of Congress hears only the roar of the printing press. During the past two years or more many of the United States mills have sought to escape by altering their product from news paper to cheap book paper, but here again they encountered a branch of the industry already overcrowded to the point of disappearing profits.

Some news print mills faced another predicament, which may not trouble Canadian plants for half a century or more—the predicament of water powers becoming too valuable to be used for grinding wood. Quite recently a United States mill, which years ago had developed a water power then considered of little value, received an offer of from \$25 to \$30 a horse power for their hydro energy. The owners were obliged to refuse the offer, for it would have meant the closing down of plants in which they had sunk half a million of their money. So they kept on manufacturing paper at a cost of \$25 to \$30 per h. p., and expected their product to compete with Canadian paper made at \$3 to \$7 per h. p., or even as in the case of the Ontario Paper Company at Thorold, power at \$12.50 delivered from Niagara Falls.

The denuding of the forests throughout the paper manufacturing states has brought on another problem

from which the Canadian mill escapes. Twelve months of good water power per year is not at all unusual with the large Canadian companies. Seven-months power is about the average south of the border. That means that for five months a year the American mill must buy pulp supplies from Canada or elsewhere, adding many dollars per ton to the cost of the output. Instead of improving with the years, this shortage of water during certain seasons has become more and more aggravated. Of course such a condition supplies a profitable market for Canadian exporters of ground wood, but even that advantage is being circumvented by the growing custom of Canadian limit owners to turn their raw material into paper and keep the big end of the profit in their own pockets. The latest illustration of this tendency to develop the industry to its fullest possibilities is in the action of the Abitibi Pulp & Power Company at Iroquois Falls, Ontario, which commenced as a pulp mill, and before marketing any of its product laid the foundations for a 200-ton per day paper mill.

Canadian pulp limit owners have often incurred the censure of United States pulp and paper makers by prophesying an exodus of all American news print paper mills east of the Mississippi into Quebec and Ontario within the next fifteen years. That seems a generous slice of optimism, but the facts are all in its favor. It is true, of course, that American capital has thus far been tardy in taking advantage of the obvious facts, for the only news print mill owned and operated by American capitalists is the Donaconna, although the Abitibi is being financed largely through American interests as well. British capital is master of the paper industry in this country, but it can only be a matter of a few years until ventures similar to the Donaconna mills become quite common, and American money shows itself alive to real opportunity.

Three factors control the success or non-success of the pulp and paper mill: Cheap and plentiful water power, abundant pulp wood supplies contiguous to the mills, good transportation facilities. In all three, Canada holds the whip hand. Whichever of the great Canadian mills one cares to examine, each item is seen to be present in remarkable degree. Laurentide, Price Brothers; Booth's Ontario and Minnesota, Spanish River, or any of the other big plants are in practically every case possessed of splendid water powers and continuous supply, good pulp limits and first-class transportation by rail and water. By improved conservation laws there can be no reasonable grounds to fear the same carnival of waste and carelessness that has reduced the pulp forests and water powers of the United States to such alarming portions. With any sort of moderate care the chief assets of the Canadian mills should be made perpetual. At all events Canada has awakened to the danger of extravagance in time to guard the bulk of her resources. In the United States, however—and this fact means everything to the future of the paper industry—the idea of conservation arrived half a century too late. The damage was done, the forests were stripped, river beds became either swollen torrents or weakened rivulets, and no forestration genius could repair these foundations of the pulp and paper mill in less than a cen-

tury and at stupendous cost. It was in acknowledgment of such facts that a director of a big Canadian news print company, the stock of which has passed through strange convolutions, and is not now paying

a dividend, said to the writer: "Within five years every existing news print company in Canada will be paying dividends not only on preferred but common as well. It is inevitable."

CHLORINE ACTION ON PINE WOOD

(Specially contributed to Pulp and Paper Magazine by Heinz C. Lane).

In order to ascertain the amount of cellulose contained in wood the Cross and Bevan way of testing is often applied. This consists in removing the lignin and other non-cellulose substances through the action of moist Chlorine gases.

While Cross and Bevan made a close observation of the chlorination on jute, such figures were not generally known with reference to pine wood.

Professor Dr. Heuser, of Darmstadt, together with R. Sieber, C.E., made the following statements:

As it is the case with jute the chlorination of pine wood will form a certain amount of hydrochloric acid which in all probability is formed by liberating hydrogen from the lignin and combining with the chlorine. However, in the case of jute the amount of hydrochloric acid corresponds to the total consumption of chlorine, in such a way that half of the used chlorine is consumed by the formation of hydrochloric acid, while the other half is taken up by the jute itself in the shape of chlorinous non-cellulose products. On the other hand, the chlorination of pine wood liberates invariably more hydrochloric acid than would correspond to the absorption of chlorine of the wood. In this case the re-action could not very well be taken—as Cross and Bevan did with jute—for a simple exchange of hydrogen and chlorine which leads to the formation of a ligninechloride.

In order to get a clear picture of the chlorination of pine wood every minute detail of the reaction was observed. From time to time the chlorination was interrupted. In each case the amount of precipitated hydrochloric acid and the corresponding reduction in weight of the wood was determined quantitatively. Together with these quantitative tests a number of qualitative tests were made. After each interruption of the process the fibres were subjected to the treatment of lignin re-agents and the amount of oxycellulose was determined through the medium of methyl-blue. With a microscope the state of the fibres was ascertained.

It was noted that the decrease in weight of the wood fibres corresponds to the formation of hydrochloric acid. The re-action works very rapidly in the beginning, in such a way that already after the first half hour most of the hydrochloric acid has been formed. After this time the fibres have had their greatest loss in weight, consequently during the same period most of the lignin has been removed. Up to the end of the second hour the formation of hydrochloric acid and correspondingly the decrease in weight of the fibres do not come up again to those obtained during the first half hour. The rate of increase in hydrochloric acid and the decrease of weight becomes constantly less. Especially after the second hour the re-action works very slowly. However, under the continued chlorination—after 11½ hours—the figures for hydrochloric acid will again increase, while the weight of

the fibres becomes greater. This increase continues to the end of the test, 22½ hours.

The formation of oxycellulose takes place quite in proportion to the aforementioned results which was proven by testing the fibres in each case with methyl-blue, and also through the action of the lignin re-agents and from observations obtained through the microscope. During the chlorination proper, in other words up to the point where nearly all lignin has been removed, only little oxycellulose is formed. The reason for this is that at the beginning of the chlorination only little cellulose is available for the oxydizing, and on the other hand, it seems that the liberated cellulose is immune against the influence of the chlorine as long as there is lignin present. This is the case when bleaching with hypochlorites. Only after all lignin has been removed hypochlorites. Only after all lignin are formed, and such quantities increase rapidly under the prolonged action of the chlorine. After 10½ hours chlorination nearly all cellulose, and after 22½ hours all cellulose has been transformed into oxycellulose. Such pronounced formation of oxycellulose explains the increase in hydrochloric acid and weight of the fibres.

The beginning of the formation of oxycellulose can be ascertained through the action of the Lignin re-agents i. e., phloroglucin and anilinesulphate solution, also by coloring the fibres with a chlorine-zinciodine solution under the microscope. Already after half an hour's chlorination phloroglucin and anilinesulphate will show no reaction, while the other lignin reagents with the exception of the unreliable ferroferri-cyanide reaction, and the yellow coloring with chlorine-zinciodine under the microscope will disappear only after two hours chlorination. This result is to be considered since after a half-hour's chlorination, there are still 79.5 per cent present of the original quantity of fibres; at this point not all of the lignin could have been removed. In other words the reaction of phloroglucin and anilinesulphate can not be looked upon as typical lignin reagents.

Very likely they can be traced back to impurities in the lignin. These impurities appear in smaller quantities in the wood than the lignin proper—a presumption which Klason and others have already made, and is hereby confirmed. While on the other hand these color reactions are due to aldehydegroups of aromatic bodies, they evidently disappear because such aldehydegroups have but little resistance against chlorine.

As typical lignin reagents the following will have to be looked upon. The Maule Reaction, which allows the conclusion that lignin is a quinone formation, furthermore the yellow coloring with chlorine gas, the black coloring with concentrated sulphuric acid, the yellow coloring with chlorine-zinciodine solution under the microscope, and finally up to a certain degree the ferroferri-cyanide reaction. Only when these reagents

fail to show any reaction the cellulose is free from lignin. And this is the point where the oxydizing and destroying influence of the chlorine begins.

The original heavy formation of hydrochloric acid is in no way proportionate to the amount oxycellulose contained in the fibres. The quantity of hydrochloric acid is rather great, while only traces of oxycellulose are present.

In other words the hydrochloric acid can not be dependent on the formation of oxycellulose. Special tests have proven that no other acid but hydrochloric acid is formed, f.i. acetic acid.

The total quantity of hydrochloric acid after two hours' chlorination was 32 per cent, corresponding to 31.1 per cent chlorine. However, for the formation of the chlorated reaction products only 9.47 per cent of chlorine was used. The plus of the hydrochloric acid might be explained if one remembers that the lignin does not resist the chlorine, but becomes oxydized and destroyed. Thus more chlorine is used than would correspond to the formation of a lignin-chlorine. On the other hand the plus in the formation of hydrochloric

acid might also be due to the reaction of chlorine with other non-cellulose bodies in the wood.

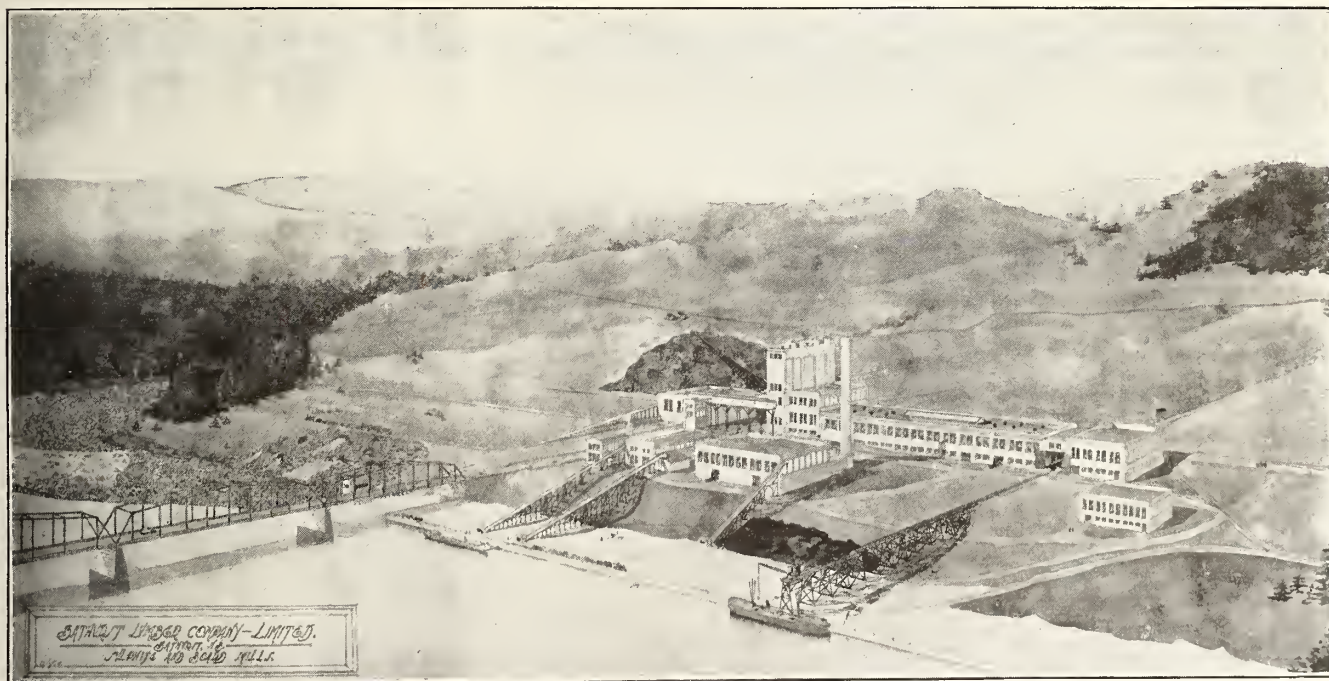
The chlorated product was an amorphe, dark yellow powder which was produced at a yield of only 7.1 per cent. Although this yield could with special arrangements be somewhat increased still, it is so small, that the fact seems to prove the supposition that the lignin becomes further decomposed through oxydation. These decompositions are evidently soluble in water, and are lost during the washing process—as was the case in these tests. The amorphe powder contained 47.03 per cent carbonates, 4.59 per cent hydrogen and 22.66 per cent chlorine.

Although the analysis would always show figures that compared well with each other, still this could not be taken as a proof for the existence of one certain unit, such as "lignin chloride." It is much more likely that in the "chloride" we have a mixture of chlorinated products. It does not seem feasible that the lignin should resist the oxydizing effect of the chlorine upon the wood, especially if the lignin is taken for an aromatic body with hydroxyl groups.

PLANS FOR NEW MILL MATURING

Preparations for the crection of the proposed Sulphite and Board mill of the Bathurst Lumber Company, are going rapidly forward under the direction of Mr. A. G. McIntyre.

2,800 square miles of timber lands attributory to the mill, and has the best storage ground for logs, in Bathurst Harbor, on this continent. The wood cut on these limits, is at least 80 per cent black spruce, which is



PROPOSED SULPHITE MILL, BATHURST LUMBER COMPANY, BATHURST, N. B.

This mill will be built of concrete and steel, and will manufacture 25 tons per day of bleached Mitscherlich sulphite pulp, and 60 tons per day of steamed Container Board. This mill will later be enlarged to a News and Ground Wood Mill. It is located at the mouth of the Nepisiquit River, on Bathurst Harbor, and has railway and ocean connections. The company owns

the best paper making fibre there is. The small wood will be used in the pulp mill, the large logs will be sawn at the company's two saw mills on Bathurst Harbor, which are sawing 250,000 feet of lumber per day.

It is expected that the mill will be in operation some time next summer, about July or August.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine).

The recent announcement by the Oxford Paper Company that it would spend \$150,000 in enlarging the capacity of its plant in Maine, does not seem to verify the prediction that the free listing of newsprint paper in the new tariff would drive the manufacturers to the wall, or across the Canadian border. In connection with such predictions, the following is quoted from the "Philadelphia Record":—

"We observe in one of the commercial papers that 'advances have occurred in many lines of cotton goods.' How is that possible under a Democratic tariff? From another market review we learn that manufacturers of woollens 'feel that they can successfully meet foreign competition with much better prices than prevailed during the current season.' In other words, they were not so much hurt as they thought they were. There is an order in the market for 45 miles of iron pipe from Persia, and an organ of the iron trade says that, while Germany may get a good deal of this, we shall probably get the larger sizes, 'the leading producer here having taken a large order for the same line last year.' That is, we competed with Europe last year, and can this year, in making iron pipe for Asia. In the last few years several cargoes of pig iron have been received in this country for casting into pipe for foreign markets. Can our protectionist friends explain this if it cost more to make commodities here than it does in Europe?"

* * *

The final conferences between the officials of the International Paper Company and the committee representing the labor unions with which its employees are affiliated, took place at the Continental Hotel, New York, on July 2. The result of this conference was the signing of an agreement for a year, dated from May 1, 1914, when the last agreement expired.

It is provided in the agreement that overtime will be paid to all employees, not less than four hours' overtime to be paid when less than four hours' overtime are worked. Time and a half in addition to straight time is to be paid for work done on legal holidays. The employers did not concede all the advances asked for, but increases in wages, according to the number of boilers in the respective plants, have been conceded to the engineers and firemen. These advances are to be retroactive to May 1 of this year.

No strikes or lockouts will take place during the term of the agreement, a system of arbitration of all disputes being provided for. The bonus system is to be discontinued, and a standard wage scale is to rule in all departments.

Eighteen conferences had already taken place, and to avert a strike concessions were made on both sides. The settlement affects about 9,000 workers in 32 mills in 22 cities. The eight-hour workday for papermakers and the nine-hour workday for other mechanics will continue.

Since the conference with the company started agreements have been reached with other paper manufacturing companies throughout the country. The largest of these are the Great Northern, the St. Croix and

the Great Lake companies, which employ in the aggregate about 7,000 workers.

* * *

Following the announcement in the last issue of the Pulp and Paper Magazine that the old wall paper manufacturing concern of Janeway & Company at New Brunswick, N.J., would retire from business, is the announcement that several of the stockholders, including a number of employees of the plant, have given power to E. M. Yorston, secretary of the Board of Trade of New Brunswick, to negotiate for raising funds to continue the concern as a going business.

William R. Janeway, president of Janeway & Co., recently announced that the factory would close down and the stockholders who have signed the paper giving Mr. Yorston power to act are desirous of interesting capital so that the company may be continued. All are practical men in the wall paper business and have been connected with the industry for a long term of years. It is understood that the outlook is bright for success to attend their plans.

* * *

These corporations have received charters at the State House: Falulah Paper Company, Fitchburg, to acquire and carry on the business of the Falulah Paper Company; capitalized for \$200,000. Albert N. Lowe, E. P. Lowe, J. A. Lowe, G. R. Lowe, R. P. Lowe, all of Fitchburg.

* * *

The summer dullness in the paper trade is in evidence, and a number of the paper mills in Holyoke, Mass., are on short time. Announcement was made on July 1 that the Holyoke, Sinden, George C. Gill, and Mt. Tom divisions of the American writing paper company would be shut down for the lack of orders and the Beebe and Holbrooke division may also be affected. The Crocker-McElwain company will also be closed for a time. The textiles seem to be a little better, although business is far from brisk for many.

* * *

The Keyes Products Company, of Montville, Conn., has several large orders on hand for their building boards and are running urgent orders. They have introduced a fireproof and weatherproof composition for their latest product, which will doubtless attract the attention of the trade.

* * *

The Kankama Paper Novelty Company, whose factory at Kankama, Wis., was visited by fire last week, is again running full blast. Extra help has been hired and the factory is now running night and day. The insurance has been satisfactorily adjusted and carpenters and masons are at work repairing the building where it was damaged by fire. The repairs will be completed some time this week.

* * *

Paper dealers of Washington, D.C., fared well in the distribution of contracts for furnishing the various Government departments with the paper and stationery during the next fiscal year. The contracts have just been approved by Secretary of the Treasury Mc-

Adoo, and were announced by the General Supply Committee. The firms in question are R. P. Andrews Paper Company, R. Carter Ballantyne, Mathers-Samm Paper Company, Charles G. Stott & Co. The contracts amount to more than \$100,000.

* * *

The demand for newsprint has fallen off since the first of May and this is having its effect upon the net profit of the producers, of which the International Paper Company is one of the largest.

There is not much doubt, however, but what the International Paper Company will show for its fiscal year a fair margin above the 2 p.c. dividend which it pays on its preferred stock. The nominal quotation on news-print is 2.05 cents, but Canadian manufacturers are offering it at two cents in the New York market. The Canadian manufacturer has an advantage of \$6 per ton in the cost of making newsprint and is thus able to undersell domestic mills.

* * *

J. R. Koons & Son have reorganized with a paid-up capital of \$50,000, under the name of J. R. Koons and Son Company. S. Rufus Koons is president and Harry Greenberg is secretary and treasurer. These gentlemen are also the controlling factors in the English Fibre Board Company, Pen Yan, N.Y., who have taken over the old Schutz mill, and expect to have it running within the next thirty days on press and similar grades of fibre boards.

* * *

An unusually large paper making machine is being built at the Beloit Iron Works, Beloit, Wis., for a Michigan paper mill. The machine is of the latest type of construction and it is equipped with 81 drying rolls. The rolls are 42 inches in diameter and 120 inches long and the whole machine is an extra large sized one. Several other unusually large drying rolls have been cast in the Iron Works foundry during the last few months.

* * *

A number of the stockholders in the Brunet Falls Manufacturing Company, at Cornell, Wis., inspected the plant on June 29. Among them were J. Davidson and W. I. Osborne, of Chicago. Mr. Davidson is receiver of the Kansas City, Mexico and Orient Railroad Company. The party is traveling in his private car. The party spent the entire day going over the property and returned in the evening to Minneapolis, Minn.

* * *

In order to make necessary repairs, the plant of the S. D. Warren Company, Westbrook, Me., suspended operations at 8 o'clock on the morning of July 4, and remained closed until midnight of Sunday, July 12, a period of nine days, including one holiday and two Sundays. While the majority of the employees of the company had the week's vacation, there was a large crew on repairs working daily during the nine days the mill was shut down. This is the longest period of time the big mill has been still since the freshet of 1896, and it is probable that the annual output of paper will be curtailed many thousand pounds.

* * *

At the beginning of the hearing before representatives of the Interstate Commerce Commission at Kalamazoo, Mich., on June 29, paper manufacturers of Michigan charged that discrimination in freight rates was responsible for paper makers of this State to lose practically all of their western trade. Among other things it was charged that Wisconsin was favored to a great extent by railways, and that as a result ship-

ping rates to points practically the same distance as from the various paper centres in Michigan were much cheaper for Wisconsin mills.

* * *

The first shipment of paper ever brought into the harbor of Detroit, Mich., was received last month by the Detroit Free Press, when the steamer Jesse Spaulding landed 1,900 rolls, weighing over 850 tons. While paper manufacturers have often figured on water transportation, it has never before been attempted. When this commodity was placed upon the free list, the Lake Superior Paper Company, of Sault Ste. Marie, Ont., with a plant easily accessible to the water, at once chartered the steamer Jesse Spaulding to ship its product. James S. O'Brien, one of the officials of the paper company, came accompanying the cargo. This is the second shipment of paper made by the company by water and represents a great saving over rail shipments.

* * *

The papermakers' strike in the mills at Fulton, N.Y., which has been in progress since May, 1913, was declared off on July 1 by the Papermakers' local. It is understood that the men gained nothing from their long struggle and returned to work at the same terms as prevailed when they quit.

The men were working in eleven and thirteen hour shifts and struck to have the shifts reduced to eight hours at the same pay as for the longer shifts, and recognition of the union. It was said that neither of the concessions asked for was made. When the strike began 150 men quit work, but as the struggle progressed with no apparent chance of settlement the men sought work elsewhere until but forty of the strikers remained in Fulton. Most of these had secured jobs in the city. Now the strikers may return without hindrance from the union. The mills affected by the strike were Oswego Falls Pulp and Paper Company, the Granby Paper Mills, the Victoria Paper Mills, the Eureka Paper Mills and the Northend Paper Mills.

* * *

The new factory of the American Box Board Company, at Grand Rapids, Mich., to be occupied by the make-up departments, was completed about July 1, and the new paper mill for the manufacture of the box board will be ready for its equipment early in August. These two buildings will give the American Box Board Company four large buildings with a total frontage of more than a quarter of a mile, and a floor capacity of about 300,000 square feet.

The new paper mill is solid reinforced concrete, 275 x 80 feet, one story and basement, with a wing for the beating room 175 x 125 feet. The old paper mill is 440 x 80 feet, three stories, and the building now occupied by the corrugating department, which will be used for warehouse purposes, is 210 x 08 feet, three stories.

A tunnel will be built from the new paper mill through the old paper mill to the new factory on the east side of Godfrey Avenue, and a track will be laid for electrical trucks for handling the stock.

* * *

It is stated that when the present extensive improvements at the plant of the Munising Paper Company, at Munising, Mich., are completed, the company will add to its present product a high-grade bond paper. It is expected the extension and repair work will be remodelled, and all modern machinery will be installed. A new slab mill is being built for the proper preparation of slabs. A bleach plant with a daily capacity of about twenty-five tons will be installed.

The pulpwood mill of S. D. Warren Paper Company at Kennebec, Me., has just been started for the season, and shipments of pulpwood have been begun. The mill is now run by electricity, the power being furnished by motors installed recently by the Central Maine Power Company, and everything is working in fine shape. The mill will ship about seventy carloads of pulpwood per week, and the amount of poplar used for the season will be about 150 cords.

* * *

James Wright, who resigned as assistant manager at the plant of the Consolidated Water Power and Paper Company at Grand Rapids, Mich., has taken the position as secretary to the president of the Bryant Paper Company, at Kalamazoo, Mich. Mr. and Mrs. Wright will spend a month visiting friends and relatives in New York State, and expect to remove to Kalamazoo so that he may assume his new duties on August 1. Mr. Wright was with the Grand Rapids company seven years, going there from Neenah, where he was with the Kimberly-Clark Company for a number of years.

* * *

The Keyer Folding Box Company, at Dayton, Ohio, which went into bankruptcy several months ago, has sold the plant, on Ringgold Street, to the Lindley Box and Paper Company, of Gas City, Ind., at its bid of \$7,100 subject to confirmation of Court. The buyer is undecided what course to pursue, but it is probable that it will be removed from this city to Gas City.

The sale covered machinery fixtures and a patent on folding boxes, and the bid was only slightly in excess of two-thirds of the appraisal. Only one bid was received for the equipment by Trustee Neumann, who is the general manager of the Dayton Paper Novelty Company.

* * *

The Inland Empire Paper Company of Spokane, Wash., announces the appointment of J. E. Carroll, a New York paper manufacturer, to the position of general superintendent of the company's factory at Milwood. The place was made vacant by the recent resignation of W. H. Goodenough. Mr. Carroll has been engaged in the paper making industry for the last 22 years. During recent years he has been with the Racquette River Paper Company, of Potsdam, N.Y., and prior to taking that position he served with the manufacturing staff of the Kimberly Clark Company, of Neenah, Wis.

* * *

Spontaneous combustion started a troublesome blaze in No. 3 chute of the United States Envelope Company's building in Cypress street, Springfield, Mass., last week. About 4 o'clock in the morning the automatic alarm in the building sounded. The mechanism was released by the automatic sprinkler above the waste chute in which the fire started. The perfect adjustment of the sprinkler undoubtedly saved the building from much damage, for when the firemen arrived in response to an alarm from the private box, 412, they found much difficulty in getting to the heart of the blaze. The chute ends in the centre of the tissue paper department room, and many rolls of tissue paper were damaged by the water.

* * *

The imports of pulp at the Port of New York for the week ending July 7 is reported at 4,489 tons. Of this 2,900 tons in 14,500 bales came on the steamship Antares from Chicoutimi, Que. This consignment was

delivered to the Tidewater Paper Mills Company, of Bush Terminal, Brooklyn.

* * *

The Nashua Card, Gunned and Coated Paper Company, of Nashua, N.H., has increased its capital from \$200,000 to \$400,000 by the issue of 2,000 additional shares of common stock at a par value of \$100. The stock will be offered to stockholders in proportion to their holdings. This gives the company \$100,000 of preferred and \$300,000 of common stock.

* * *

The New York office of S. D. Warren & Company, manufacturers of book and coated papers, underwent a change in personnel on July 1. Jesse W. Clark, formerly manager of the manufacturing department of the Osborn Co., calendar makers, at Newark, N. J., is now in charge of the office at 25 Madison avenue. Benjamin Van Wyck, who has been previously identified with the trade, is city salesman.

* * *

Receivers Alexander W. Pound and William R. Siegle sold the United Indurated Fibre Company plant in Lockport, N.Y., on July 1, to Attorney Philip W. Russell, of New York City, for \$300,000. Mr. Russell submitted the only bid. The amount was the same that Justice Pound said would be the lowest bid received. It is understood that the H. W. Johns-Manville Company will resume control of the Lockport plant; that the company will be reorganized; the plant started in operation before fall, and that a number of new lines of manufacture will be developed. Federal Judge John R. Hazel to-day granted an order calling on all concerned to show next Friday morning why the sale should not be confirmed. The receivers are running the plant until the show-cause order is considered in Buffalo on Friday. So far as can be learned, none of the creditors of the old company will protest the receiver's sale. The creditors will receive about 80 cents on the dollar.

TIMBER LIMITS SOLD.

Toronto, July 7.—Hon. W. H. Hearst, Minister of Lands, Forests and Mines, to-day announced the acceptance of tenders for the sale of three large timber limits in the Metagami Indian reserve. The area of each of the limits is 36 square miles, and the awards are as follows Berth No. 1-b—J. J. McFadden, Renfrew, red and white pine, \$3.55 per 1,000 feet. Berth No. 1-c—J. J. McFadden, Renfrew, red and white pine, \$4.56 per 1,000 feet. Berth No. 1-d—Hope Lumber Company, Bay City, Mich., red and white pine, \$5.55 per 1,000 feet. All at \$2 dues and \$10 per mile ground rent. In each case the tenders were awarded to the highest bidders.

ONTARIO'S PULP AND PAPER.

Julius D. Dreher, United States Consul at Toronto, in a report on Ontario industry states that of the \$23,104,560 invested in the Canadian paper trade, \$3,706,800 is invested in Ontario, and that of the \$30,782,373 invested in the Canadian wood pulp industry \$14,080,088 is invested in Ontario. As to products Ontario produces \$3,002,568 worth of paper out of a total of \$14,109,014 for Canada and \$4,487,827 worth of pulp out of a total of \$9,117,465 for Canada.

Canadian Press Association Meets in Toronto

(Special to Pulp and Paper Magazine).

Toronto, July 11.—With a record attendance, the fifty-sixth annual meeting of the Canadian Press Association was held in the King Edward Hotel, on Thursday and Friday of this week. Editors and publishers were present from all parts of Canada. There are now 735 members of the association and the receipts from fees for the present year have so far amounted to \$7,700. It will be remembered that last year the rates for membership were radically increased but there has been scarcely any falling off.

The Press Associations of the Maritime Provinces, Western Canada, Alberta, and Eastern British Columbia are now included as territorial associations of the Canadian Press Associations. President Hal B. Donley, of the Simcoe Reformer, presided over the deliberations, which were unusually important, in view of the threatened increase in postage rates.

The Postmaster-General at Ottawa recently announced that the rate of postage on newspapers was one-quarter cent a copy instead of a bulk rate of one-quarter cent per pound, and made the further announcement that, where letter carrier delivery is in operation, a separate charge of not more than one cent a copy would be made for the delivery of newspapers by carrier. The report of the Postal Committee was read by J. M. Imrie, who reviewed the negotiations which had been in progress since 1912, when, at a joint meeting of the Canadian Press, Limited, and the Canadian Press Association, action was taken, which resulted in a report on the postal situation being made for the organization by M. E. Nicholls, of the Montreal Mail. On the basis of this report, the Associations made to the Postmaster-General recommendations which, if put into effect, it was believed would have rectified abuses of the second-class mailing privileges and relieved the pressure on the Post Office Department, this being the object the Postmaster-General had declared his desire to effect.

Negotiations with the department were continuing during the present year when it was discovered that the third reading in the Commons had given to Bill No. 147 the effect of taking the control of newspapers postage rates out of the hands of Parliament and placing it in the hands of the Postmaster-General. The Postal Committee immediately protested against the principle of this Bill, first to the Postmaster-General, and, that being ineffective, to the Senate. The latter body, amending the Bill, it was withdrawn by Hon. Mr. Pelletier. More recently a notice was sent to publishers as already outlined, whereby the Postmaster-General proposed to exercise certain powers claiming that there is no statutory regulation which compels him to let one-quarter of a cent per pound rate be applied as a bulk rate and intimating that he can make it one-quarter of a cent per copy.

The effect of this charge, if put into practice, would be an enormous increase in the postage rate. Hon. Mr. Pelletier also claims that, under an old clause, which has been in existence since the days when postage was collected from the recipients of mail, he can impose postage on newspapers up as high as one cent a copy. It was suggested by the Postal Committee that every member of the Association make it a point to protest personally to the Member of Parliament for his constituency against the transfer of the control of

newspaper postage from Parliament to the Department, and against any new interpretations of the Act which might injure so deeply the newspaper business as might those recently outlined by the Department.

A new postal committee was appointed at the convention with P. D. Ross, of the Ottawa Journal, as Chairman. This committee presented the following report in connection with the various questions which had arisen in regard to newspaper postage. The report was adopted by practically a unanimous vote.

First—that a further interview be had with the Postmaster-General by the committee at an early date with a view to an amicable understanding; any suggested re-arrangement of rates by Parliament arising therefrom to be reported to a general meeting of the association for instructions before acceptance. Second—That in case such interview with the Postmaster-General does not seem to promise a satisfactory outcome, the Postal Committee be authorized to organize as large a deputation of members of the Association as can be secured to wait upon the Prime Minister to protest in the strongest possible way against the removal of control of postal rates from Parliament and against the proposed arbitrary rulings of the Post Office Department in connection with rates. Here the matter stands at the present time.

Profitable sessions were held of the daily, weekly, and trade and class sections and the principal officers elected were: President of the Association, W. M. O'Beirne, Stratford Beacon; Vice-Presidents, Maritime Provinces division, R. L. Cotton, Charlottetown Examiner; Ontario and Quebec division, W. E. Smallfield, Renfrew Mercury; Manitoba-Saskatchewan division, W. F. Kerr, Regina Leader; Alberta and Eastern British Columbia division, J. H. Woods, Calgary Herald; Western British Columbia division, John Nelson, Vancouver News-Advertiser. Sec. J. M. Imrie, Toronto; Treasurer, J. H. Cranston, Toronto Star.

J. G. Elliott, of the Kingston Whig, was elected chairman of the daily division; E. Roy Sales, of the Port Elgin Times, of the weekly division, and Col. J. B. MacLean, Toronto, of the trade and class section.

J. F. MacKay, of the Toronto Globe, was elected chairman of the Paper Committee; E. F. Slaek, of the Montreal Gazette, of the Labor Committee; W. J. Taylor, of the Woodstock Sentinel-Review, of the Advertising Committee, and P. D. Ross, of the Ottawa Journal, of the Postal Committee. The report of the Paper Committee, which was presented by John M. Imrie, Secretary of the Association, referred in detail to the present news-print production in Canada, the increased tonnage for the coming year, the augmented shipments to the United States, and furnished statistics which have already appeared in the Pulp and Paper Magazine. One matter touched upon was the way in which Canadian newspapers were discriminated against in the matter of freight rates as compared with rates on shipments of news-print across the border. It was stated that over one thousand tons per day were being sent to the United States and that before long this would reach 1,200 daily.

The "International" number of "The Pulp Maker," London, is a most creditable production. Articles on the pulp and paper situation all over the world, in seven different languages, and special contributions on foreign countries by the Editor, S. Chas. Phillips, M.S.C.I., through which he made a tour during the year.

Ottawa Notes

Ottawa, Ont., July 10.—(Canadian publishers were directly interested and Canadian paper manufacturers indirectly concerned, in the announcement which has been made by the Post Office Department that the rates of newspaper and periodical postage have been advanced. Where the old rate was one-quarter of a cent per pound for this class of mail matter, the new rate will be the same where there is no delivery, but will be one cent per pound where papers are delivered by carrier.

In other words, postage on a Canadian newspaper will in future be about equal to the cost of the paper itself, and in some cases where evening dailies are mailed at a reduced price, as in the case of a well-known Montreal evening paper, will be much greater than the price of the paper. It is not thought that this rate is intended to be permanent, but it is accepted by publishers that there is to be an appreciable increase in the cost of mailing newspapers and periodicals after this in Canada. A conference will be held shortly between the Post Office Department and the publishers to endeavor to arrange a compromise.

As a result of the exceptionally rainy weather during the past two weeks, the water in the Ottawa River has risen and both in this stream and in the Gatineau Valley, the level is high enough to float logs, which threatened to be hung up for the summer. Opposite the Rideau Canal locks near this city, the Ottawa river has now risen over two feet.

The bursting of the conservation dam at Lake Temiskaming, of course, contributed to this result. Later news received from the scene of this accident is to the effect that it has resulted in leaving millions of logs, and much pulpwood, high and dry on the shores of Lake Temiskaming. This condition of affairs is to be remedied, however. Advantage has been taken of the fact that the city is full of unemployed Ukrainians and other foreigners to hire large numbers of them to go to Lake Temiskaming and clear its banks of this lumber. A firm of government contractors is doing the work, and it is expected that all the logs will be successfully floated. The lumber camps have also absorbed a considerable proportion of this surplus labor.

Increases in the tariff on decalcomania paper, and on caustic soda, both of which are of interest to the pulp and paper industry, went into effect on July 1, last. Ordinarily they would have become effective after the announcement of the new tariff in Parliament in April but were held over to meet the situation in British Columbia where deliveries around the Horn of shipments were awaited.

The Railway Commission yesterday issued an order in the case of the Esquimaux and Nanaimo Railway Company, which desired to construct a line across the railway of the Anderson Logging Company at a point between McBride Junction and Courtenay, B.C. The Board, while authorizing the crossing, orders that an interlocking plant must be installed to prevent trains of the logging company, loaded with lumber, from colliding with trains of the applicant company.

The Eastern Canada Lumber and Pulp Company, a new concern which was incorporated under Dominion laws last year with head office in Ottawa, has not yet started business. To your correspondent, Mr. George F. Perley, manager of the Capital Office Supply Company, who is a director of the company, stated that no attempt at organization would be made until condi-

tions prove more favorable toward this end. The company aims to do a trading business in lumber and pulp, and has no present plans for manufacturing these commodities.

Considerable interest is being taken by the trade in the project involved in the survey of the Saskatchewan River, which will be completed this autumn by the Public Works Department. The plan is to obtain a waterway from the foot of the Rockies to Winnipeg. It would be five feet deep, enough for barge traffic. The Northwest as a pulp and paper field has only lately begun to receive attention. Large districts, particularly in the valleys of rivers, are covered with good pulpwood, and there is no lack of waterpowers. Mr. L. G. Denis, chief engineer of the Conservation Commission, in an interview in this regard last week, made the statement that Canada's northern waterpowers were industrially valuable. "The existence of numerous falls and rapids in these parts is not denied," he stated, "but the argument is advanced that the temperature and other climatic conditions existing where these falls and rapids are situated, will prevent their utilization." In contradiction of this statement he cites the case of Norway, whose climatic conditions are similar to those of Canada, whose size only slightly exceeds that of the Maritime provinces, and yet which has waterpower plants with a total capacity of over 1,500,000 horsepower. With these advantages, and with the construction of the Saskatchewan barge canal and the Georgian Bay canal, the West will be in a position to take its place as a pulp and paper field.

MAC.

PAPER EXPORT.

Secretary of Commerce Redfield has announced that a special investigation of foreign markets with particular reference to the possibility of selling American paper of all classes, has been made for the Bureau of Foreign and Domestic Commerce through the American consular offices stationed in the various countries. As far as possible complete information has been obtained regarding the character and source of the paper supply, the market requirements, home production, import trade, etc., also the names of large users of paper, names of governmental departments making purchases and names of persons who might become agents for American exporters. The samples received include all weights of paper, from thinnest Japanese to coarsest ledger, and qualities from the finest bond to the cheapest wrapping and printing paper. The reports cover the entire world, except Africa.

The information is to be made available to American manufacturers in manuscript form and, following the bureau's regular practice, the reports and accompanying samples will constitute a travelling exhibit which will be displayed in various cities for examination by interested parties.

TO STUDY WOOD UTILIZATION.

Prof. H. K. Benson, of the University of Seattle, Wash., has been appointed a commercial agent in the Bureau of Foreign and Domestic Commerce by Secretary Redfield of the Department of Commerce. He will go abroad immediately to study the utilization of by-products of the lumber industry. Other representatives of the bureau will make intensive studies of possible markets for wood products of all kinds, probably in European and South American countries.

KEEPING CLOSE TAB

U. S. Wrapping Men to Get Statistics and Adopt Standards.

(Special to Pulp and Paper Magazine.)

New York, N. Y., July 12, 1914.

The Wrapping Paper division of the American Paper and Pulp Association, of which H. H. Bishop is Secretary, issued a pamphlet last week to its members outlining the purposes of that part of the association. It is the main object of the Wrapping Division to give special and closer attention to statistical details, and it is understood that the other divisions will soon follow in the footsteps of the leader. The pamphlet is quoted as follows:

The Wrapping Paper Division is a sub-division of the American Paper and Pulp Association, to membership in which any manufacturer of wrapping paper is eligible.

The American Paper and Pulp Association is an organization to membership in which every manufacturer of paper and pulp is eligible. Its objects are defined in its constitution and by-laws to be:

"To promote the welfare of the paper and pulp manufacturing industry of the United States."

In pursuance of this object the American Paper and Pulp Association has endeavored:

1. To develop statistical information about production, shipment and stock of each grade of paper and pulp.

2. To repeat, and wherever possible, to amplify statistics relating to the industry derived from government and private sources, and from special statements rendered regularly to it by the government.

3. To watch legislation on tariff, hours of labor, safety provisions, weights and measures, workmen's compensation, and all other subjects related to the industry, and to inform members concerning such matters.

4. To collect a library of the industry, consisting of private, public and government publications from every paper and pulp producing country of the world, and impart information so obtained to members when called for.

5. To keep records of the growth of the South American paper and pulp markets so far as records are available.

6. To make charts of all kinds to show graphically various conditions of great interest to the industry.

7. To undertake, wherever possible, the preparation of any sort of information requested by members, such as the investigation of power consumed, yield of pulp per cord of wood, sources of raw materials, rainfall conditions, etc.

8. To foster in every way movements towards the following:

The adoption of uniform trade customs for each grade of paper and pulp.

The adoption of uniform cost systems.

The standardization of materials and products.

The prevention of industrial accidents and adoption of safety devices.

The maintenance of fair wages.

The establishment of vocational paper and pulp training schools.

The maintenance of governmental experiment stations, like that at Wausau, Wis., for the paper and pulp industry.

9. To be, in every sense of the word, a clearing house of information for the industry in all matters in which the individual manufacturer cannot, on account of the cost, lack of time, fear of his competitors, or any other cause, do the work.

Heretofore each of its Divisions, consisting of the Cover Paper Division, Writing Paper Division, News Paper Division, Tissue Paper Division, Chemical Pulp Division, Wrapping Paper Division, Coated Board Division, Board Division, Glazed and Fancy Paper Division, etc., has been administered by one of the manufacturers, who was termed a "vice-president," and who gave particular attention to the interests of the division with which he was identified.

In April, 1914, the Wrapping Paper Division at a meeting held in Chicago determined to organize in a different manner, and to give the duties, heretofore performed by the vice-president without compensation, to a paid secretary, who would devote his entire time to the interests of this division. In accordance with that decision H. H. Bishop, of Cleveland, O., was chosen as secretary on April 20, and assumed the duties of his position immediately thereafter.

There have been two meetings held since he became secretary, a report of which was sent to you recently.

The Objects of the Wrapping Paper Division.

The Wrapping Paper Division decided at these meetings to adopt measures to achieve the following objects:

1. The establishment of a standard cost-accounting system in each mill.

2. The improvement of statistical reports by going more into detail than has been the case heretofore.

3. The filing of reports of sales with the secretary at monthly intervals, giving the following details: (a) Quantity sold; (b) billing price; (c) freight allowance; (d) cash discount; (e) trade or tonnage discount; (f) any other concession of any character. The purpose of reporting in this form being to ascertain the price at which all paper was sold f.o.b. mill. In addition to the information in the above form, each manufacturer will be expected to name the lowest price obtained for each quality, highest price and the average price. The secretary will be expected, after receiving and compiling these reports, to give to all those who furnish them, and to them only, information covering the aggregate of reports received, showing range of price received for each kind of quality of paper, lowest price, highest price and the average price of the whole.

4. The creation of subdivisions, such as the Fibre Division, Manilla Division, Kraft Division, Jute Division, etc., for the purpose of holding meetings of the manufacturers who are interested in these particular lines, and the consideration at those meetings of problems peculiar to them.

These are the activities so far determined upon. The secretary has other activities in mind to be recom-

mended and acted upon at some future date, the tendency of all of them being toward greater usefulness to the members. Some of the things in mind and which may be given as an example are:

1. Measures to standardize the product as to weight, quality, etc.

2. Measures to define ethical trade customs.

3. The discussion of relations to jobbers and brokers.

The secretary will also from time to time communicate with the members in accordance with suggestions that he may receive from any of them in regard to other proper activities.

Another function of the secretary, and very important, will be acting as arbiter of differences that may arise between individual members, investigating reports transmitted to him of unbusinesslike or unethical conduct on the part of any member, the result of which would be injury to some fellow member; the constant encouragement of confidence, good will and harmony between members.

The secretary does not pretend to have any technical knowledge of the paper industry, but does claim considerable experience in organization work, similar to that mapped out here, and it is expected that his close attention to the affairs of this division will result in benefits difficult to measure—some of them direct in their nature and others indirect, but all tending toward uplift of the industry.

BRAZIL A POSSIBLE PAPER MAKING COUNTRY.

Brazil, according to an article in the "Brazil Economique," possesses inexhaustible stores of the raw material (wood) for the manufacture of paper, besides which the country is well provided with a variety of fibres. But, as in other countries where the Government has not thought fit to interfere in time, the get-at-able growths of wood have been pretty well exhausted already, and timber at considerable distances from the ways of communication, although in such incalculable quantities, can hardly now be counted on as the basis of a great industry. Ways of communication (railways, that is to say) must first be made before the timber or paper-pulp industry can be developed on anything like a paying scale; otherwise, the cost of transport will prove to be prohibitive. But there is other raw material that might be exploited and exported, such as the bamboos, which are in plenty. They reproduce themselves with great rapidity, and offer no difficulty in respect to collection, as is the case with heavy timber, and large quantities of them grow convenient to the port of Paranagua, where the marshy land is particularly favorable to their cultivation or propagation. On the initiative of the English Vice-Consul of Curitiba, a test has been made in the use of these bamboos. One need not follow the statistics quoted in the article to show the urgent need for such an industry as paper manufacture locally. It is sufficient to say that the importation of paper materials is very large. And it must appear, as the article says, strange to the inhabitants of Brazil that foreign countries can make the manufacture pay with imported raw material, if the same cannot be done in Brazil with the raw material in the country in abundance.

The Powell Lake Mill Co., Ltd., has been incorporated with a capital of \$40,000 to carry on the manufacture and trade in all kinds of wood products including pulp.

Tests as to Bleaching Qualities

By HEINZ C. LANE.

The well known fact that unbleached Sulphite pulp shows a reddish color under the influence of such oxydising agents as potassiumpermanganate, hydrogen-peroxide, potassium-bichromate, etc., can be taken as a guide to the relative bleaching qualities of such unbleached stock.

The easier bleaching a certain pulp is, in other words the lower the percentage of SO_2 was at the end of the cook, correspondingly less will be the amount of organic substances which through oxydation of the above mentioned reagents will show a red color. This means nothing else but that those organic substances become destroyed with the progress of the cooking process. Consequently from their presence—either high or low—a conclusion can be formed as to the degree of disintegration and bleaching quality of the sulphite pulp.

This fact has been proven by numerous tests with various unbleached sulphite pulps which had a wide range as to their bleaching qualities. The treatment with potassium-bichromate showed very distinct differences as to the red color on the various samples. Thus it was rather easy to classify them with reference to their bleaching qualities. These results were later on compared with an often applied bleach test and found to check up closely.

The test is made as follows:—Even quantities of the potassiumbichromate solution, about 3 to 5 cc. are poured in quick succession on the samples to be tested. This solution is composed as follows: In each litre of water there are 0.25 grams $\text{K}_2\text{Cr}_2\text{O}_7$ and 10 cc. n/1 HCl .—A few seconds after the application the red color will show attaining its brightest color after about 2 to 3 minutes. With the basis of a comparative color scale the classification can be easily made. Weaker or stronger solutions with more or less hydrochloric acid will reduce the shading of the red coloring. The test itself is rather simple and takes but little time. It goes without saying that such a test can only serve as a comparative guide for the products of one and the same mill. In case of different origins of the pulp to be tested this treatment would be of no value, since it is imperative that the cooking process, the washing and all other handling of the stock be identically the same.

GERMAN PAPER EXPORTS.

A German comparative return of paper exports for the last two years show the following results:—

	1912.	1913.
	Tons.	Tons.
Board	222	293
Roofing board	109	105
Wrapping paper (pulp dyed)	778	849
Printing paper	552	687
Writing paper	162	180
Other kinds	392	447
Total of German paper exports	2,215	2,561
Total imports	306	292

Attention has been called to the market increase of exports in board and printing paper. In the latter, export business has been forced upon manufacturers by the unsatisfactory condition of the domestic trade. —World's Paper Trade Review.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE



London, July 4, 1914.

The paper mill at Calder Grove, belonging to C. Marsden and Sons, Ltd., was the scene of a serious fire the other day, and damage estimated at \$20,000 has been done. Fortunately the fire was confined to some huge stacks of wood pulp built near the railway, which serves the mill, and several brigades of fire-fighters saved the mill. When the fire was first discovered the mill fire brigade was called out, but it was soon found out that further assistance was necessary, and this was requisitioned by telephone. Meantime, the large stacks of pulp were being enveloped in flames, and the inflammable state of the bales left the firemen practically useless, notwithstanding the fact that the mill canal was close at hand. About 3,000 bales were destroyed, and it is said that a spark from the engine on the railway caused the conflagration. It will be remembered that this time last year the same firm had a disastrous fire at their mill at Barnsley. The damage at Calder Grove has been covered by insurance.

Bury Paper-Making Co.

The half-yearly report of the Bury Papermaking Co., which owns the Gigg mill, near Bury, in Lancashire, shows a gross profit on trading of £6,752. After paying certain charges there is £3,679 left. Adding the balance brought forward from last year amounting to £14,711, there is a disposable balance of £17,850. The directors consequently recommended a dividend of 10 per cent, plus a bonus of 2½ per cent, carrying forward £14,553. The gross profit a year ago was £8,277, the dividend the same as now and the balance carried forward £13,260. It will be seen from this report that the Bury Papermaking Co. is one of the firms that has already had its trading account profits affected by the state of bad trade during the past half year, but taking things on the whole the mill has not what one might call a bad year. No doubt this is due to the good management and the excellent reputation the mill enjoys in the British paper industry.

Altering Stokers.

A unique alteration to stokers has been recently effected at the Ingress Abbey Paper Mill belonging to the Wall Paper Manufacturers, Ltd., at Greenhithe. The work was carried out by Edward Bennis and Co., Ltd., of Lancashire, and it shows four Bennis chain grate links fitted to frames of another make. Edward Bennis and Co. were requested to re-link one of the existing grates with their long-life patent link and to guarantee to burn 25 lb. of coal per square foot of grate per hour with a reasonably good draught, and to obtain from 11 per cent to 12 per cent CO₂. The coal to be used is a good rough small coal, and the combustion is to take place without burning the links. The guarantee has been easily fulfilled, with the result that Messrs. Bennis have now received orders to re-link the other three additional grates.

Labor reivances.

Sometime ago the government offices were given instructions that in all contracts it was to be stated that the contractor must pay workers a fair wage, according to what Trade Unions recognised as a fair wage, and this clause in the contracts entered into has prompted

the National Union of Paper Workers to instruct the Secretary to the Treasury if he was aware that A. Cowan & Sons, Penicuik; the Ilford Paper Mills Co., Ilford; T. H. Saunders & Co., High Wycombe; J. Allen & Sons, Ivybridge; Reed and Smith, Cullompton; J. Cropper & Co., Kendal; R. Fletcher & Son, Stoneclough; and C. T. Hook & Co., Snodland in Kent, were not observing the fair wages clause, and if he would have inquiries made into the matter and in the course of the investigations receive a deputation from the National Union of Paper Workers. He was also asked if he was aware that R. Somerville & Co., of Creech Mill, near Taunton, paid the lowest wages of any firm in the British paper trade; that the rate paid to general workers is 11s 6d (about \$2.76) per week; that the day-shift men work 72 hours and the night-shift men 68 hours per week; that other firms in the South of England pay \$6 per week for shifts of 66 day and 60 night. A reply to those questions has been given by the Secretary to the Treasury, who says that inquiries will be made into the questions raised and that representations may be sent from the national Union of Paper Workers. The results will be awaited with interest.

Mill Improvements.

The new mill at Maidstone for Messrs. A. E. Reed & Co., is gradually drawing to a completion and when finished so far as the machinery is concerned—which the owners are now engaged in installing—it will be the most modern concern in England in the paper trade. The output of all the Reed mills at present is about 1,100 tons of paper per week and the mill is to be worked by electricity. Messrs. Calder & Co., of Inverkeithing, one of the Scotch mills, is also at work and the new buildings erected constitute an imposing sight from an architectural point of view, whilst inside the most modern machinery has been erected. The Imperial Paper Mills at Gravesend, have just installed sitting and reeling machines for 90 inches of paper. This makes the sixth installation at these mills to take up to 114 in. webs, and to reel from 9-inch wide and upwards. The Imperial Mills are reckoned to be—or at least will eventually be—the largest in the United Kingdom, as the plans originally laid down and worked out are on an extensive scale—so much so that other paper mill owners in the north and south of England have become somewhat nervous of the things contemplated.

An interesting test case is shortly coming before the Railway and Canal Commission Court in London, in which Messrs. Smith, Stone and Knight, Ltd., paper merchants of Birmingham and Bristol, are to appeal against the high tariffs of the railways. They spend no less than \$57,600 a year on railway transit and an application has now been made to the court to make the various railway companies disintegrate certain notes they have enforced on the paper merchants. The court has ordered the companies to do so, and naturally this will entail an enormous amount of work and expense which the railways will not like. The case is a very important one and the British Paper Makers' Association, financially and otherwise, are giving Messrs. Smith, Stone & Knight, Ltd., a helping hand in

their case—an action of which the Canadian Pulp and Paper Association might take note.

Mine Discovered.

Mr. E. P. Morris in the course of an article in "The Britannic Review" states that the Anglo-Newfoundland Company, of London, who own the paper mills at Grand Falls, some time ago came upon what promised to be a very excellent mine, through one of their surveyors picking up a piece of ore-bearing rock in the woods. The locality proved to contain a complex ore body consisting of lead and silver, and covered with a little gold. They have sunk a shaft on it for 300 feet, and found a bed of ore 9 feet wide with a mineral line in lenses. As they were hurrying over work at Grand Falls operations have been suspended for the time being. The company have also large farms which they are turning to great use and employ over 100 horses in the woods every winter. The Anglo-Newfoundland Company, in which Lord Northcliffe is largely interested, supplies paper to the "Daily Mail," the "Evening News," "Times," and other large London daily and weekly papers, in addition to several of the monthly magazines.

Paper Man Honored.

Canadians will be interested to learn that the Lord Mayor of London (Sir. T. Vansittart Bowater, head of the firm of Bowater & Sons, Ltd., paper makers and agents, London), who sent through the Pulp & Paper Magazine London correspondent a very kindly message to Canadian Pulp and Paper men on the occasion of his accession to the Mayoralty, has been raised to a baronetcy of the United Kingdom by King George V. The honor is a very distinguished one, and is given for Sir Vansittart's services in entertaining the King and Queen of Denmark in London some weeks ago. Mr. Rainald Bowater, who is now secretary to Bowater and Sons, Ltd., becomes heir to the title and curiously enough, it was only the other day that Mr. Rainald was married. The wedding was a very fashionable one and was largely attended by pulp and paper men.

Excess Fibre.

I have been favored with a copy of the report of the Swedish Chamber of Commerce in London, and I see that when cellulose makers supply an excess of fibre under a stipulated contract, it is customary to charge for the excess, when such had been found as a result of analyses, and also to charge for the cost of analyses when the test is made at the instance of the buyer. This question has been settled by the British Wood Pulp Association, and it is a point that the Canadian Pulp and Paper Association might look into, if they have not already done so.

A Canadian Order for England.

Messrs. J. Marx and Co., Finsbury Pavement, London, have received an order from the Belgo-Canadian Pulp and Paper Co. to supply two crystalline stone wet press rolls for the 220-inch machine that Charles Wahmsley and Co., the papermakers' engineers, of England, are building at the Shawinigan Falls mill. The weight of the stone wet press rolls is 9 tons each, and it is the special kind of stone that Messrs. Marx use that make these rolls so popular in most of the up-to-date mills.

The Ontario Government is purchasing titles to timberlands within Algonquin Park, with a view to securing immunity from fire and an increase in revenue for the Province. From the Munn Lumber Company 350 square miles within the park were purchased for \$290,000.

British-Canadian Trade-Exports of Paper to Canada and Canadian Exports to United Kingdom

(By Our London Representative).

London, July 2, 1914.

I have received from the British Trade Board, statistics of the paper trade between the United Kingdom and Canada, and other British possessions, in addition to foreign countries. These statistics are usually issued each year about this time and they cover a period of five years back counting from the end of 1913. For the information of pulp and paper men who study my notes each month in the "Pulp and Paper Magazine," I desire to point out that these statistics may be taken as fairly accurate—not absolutely—and they give a good indication of how Canadian trade is progressing in the British markets. I only repeat what has already been stated in the British Trade News appearing in the Pulp and Paper Magazine from time to time, viz., more of the British trade should be captured by pulp and paper men in the Dominion, and when the prices are on the same basis as the Scandinavian prices, Canadians will undoubtedly get precedence above any other manufacturers. If personal attention cannot be given to the market, agents should be prevailed upon to give the British trade greater attention and secure more of the pulp contracts—most valuable ones these are sometimes—and newsprint orders that are constantly being handed over to other sources.

The total imports of paper of all kinds, boards, playing cards, paper bags, envelopes, etc., reached £7,674,419 (£1 equals about \$4.80 or \$4.82) an increase of £439,982 over 1912, and an increase of £2,026,982 when compared with 1909. Of these imports the following shows the supplies received from Canada and Newfoundland:

Paper on Reels.			
1912	1912	1913	1913
Cwts.	£	Cwts.	£
790,653	394,764	860,123	428,066

These figures only relate to Newfoundland. But the largest supplies came from Norway with Sweden and Germany next, the totals amounting to 2,628,869 cwts. valued at £1,466,509, compared with 2,657,153 cwts. in 1912, valued at £1,451,005.

Printing and Writing Paper Not on Reels.

The total reached 1,002,193 cwts. valued at £877,423, as against 926,379 cwts. valued at £836,468 in 1912. The supplies from Canada are:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
171,982	84,397	1,873	1,092	766	479

Norway, Germany and Sweden and Belgium are the biggest suppliers in the order mentioned.

Paper Hangings.

The imports are valued at £272,780 for 102,948 cwts. compared with 110,342 cwts. at £273,962 in 1912. No supplies from Canada are recorded and the same remarks apply to packing and wrapping paper which reached 4,090,296 cwts. at £2,837,238 in 1913, as against 3,725,506 cwts. at £2,586,027 in 1912. Strawboard was imported to the extent of 3,500,432 cwts. at £978,334, as against 3,285,011 cwts. at £898,259 in 1912. The Netherlands supply most of the strawboards.

Boards.

Millboards and wood pulp board were received to the extent of 1,312,682 cwts. at £634,047 in 1912 and in 1913 these imports rose to 1,319,078 cwts. at £665,977. The supplies from Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
125,924	56,948	213,982	94,480	222,615	104,161

To manufacturers of boards in Canada these figures are gratifying, but it must be remembered that Finland, Sweden and Germany are keen competitors in the boards. Therefore, the Canadian trade should be well nurtured and watched.

The remaining imports are made up of boxes and cartons of paper, card board and unenumerated classes of paper in which Canadian figures are not given:

The exports of the British mills to British possessions and foreign countries reached £3,679,195, an increase of £119,878 over 1912 and an increase of £1,119,824 over 1909. The total exports of paper, boards, etc., to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
107,337	169,164	178,067	266,763	172,158	265,635

Writing Paper.

Writing paper was exported to the extent of 218,476 cwts. at £476,286, compared with 217,444 cwts. at £469,504 in 1912. The exports to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
9,231	20,670	5,960	16,646	6,646	15,413

Printing Paper.

Printing paper was exported to the extent of 1,871,721 cwts. at £1,823,163, compared with 1,782,504 cwts. in £1,746,141. Canada took the following supplies:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
72,315	91,914	121,948	147,018	121,649	150,763

Packing and Wrapping Papers.

The supplies to all countries are valued at £379,682 (905,452 cwts.) as compared with 848,396 cwts. at £347,356 in 1912. The supplies to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
11,962	17,846	20,285	30,896	18,193	29,594

Coated Paper.

Coated papers were exported to all countries to the extent of 27,994 cwts. valued at £128,397, compared with 34,045 cwts. at £148,091 in 1912. Canada was supplied as follows:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
716	1,873	1,661	4,626	1,354	4,444

Paste and Millboards.

For the year 1913 the exports were 125,211 cwts. at £116,618, compared with 110,291 cwts. at £103,044 in 1912. To Canada the British mills sent:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
2,424	3,061	3,865	4,049	2,440	2,144

Manufacturers of Paste and Millboards.

Out of the export trade of 10,875 cwts. at £26,659 (compared with 9,547 cwts. £21,352 in 1912) Canada took 423 cwts. at £1,715 in 1913; 1,197 cwts. at £2,493 in 1912 and 2,181 cwts. at £5,249 in 1909.

The total trade with foreign countries reached in 1913 £1,399,007 (compared with £6,698,813 in 1912) and with British possessions £569,570 (as against £535,624 in 1912).

Annual Consumption of Wood by the Manufacturing Industries in the United States

Statistics have been compiled by the U.S. Forest Service which show for the first time precisely how the lumber produced in this country is utilized. About 45 billion feet of lumber of all kinds is the annual production in the United States; of this nearly twenty-five billion feet, board measure, are further manufactured, the other portion remaining for rough construction lumber and for similar purposes. This is exclusive of material which reaches its final use in the form of fuel railroad ties, posts, poles, pulpwood, cooperage, wood distillates and the barks and extracts demanded by the tanning industry.

The work of collecting and compiling the figures extended over a considerable period and was carried out state by state, but as one full year was made the basis of statistics in each state, the total is a fair average of the use of lumber in further manufacture in the whole country, between 50 and 60 per cent of the lumber produced is subject to further manufacture. In preparing the figures in this way, however, it should be remembered that considerable material reaches shops and factories in the form of logs, bolts and billets without having passed through saw mills; and while this material is included in these statistics this fact should be remembered in comparing the statistics with those of lumber production.

Nearly or quite 100 different woods are used in this country under their own names, while an unknown number find their way to shops and factories without being identified, or separately listed, except under general names. In quantity the soft woods, the needle-leaf or coniferous trees, are most important, but there are a greater number of species among the hardwoods, or broadleaf trees. Yellow pine comes first with more than eight billion feet, followed by white pine with three billion, and Douglas fir with a little more than two billion. It should be understood, however, that the term "yellow pine" includes several species, the three most important of which are longleaf, shortleaf and loblolly. Oak, including all species, has nearly two billion feet, and is the most important hardwood. Maple comes next.

Dogwood comes about halfway down the list with more than seven million board feet, and of these species mentioned Turkish boxwood comes last with less than thirty thousand feet, followed by many others too insignificant to list, but making a total of all kinds of more than a million feet. Of the native species, laurel, holly and yucca fall very near the foot of the list in relative quantities used.

Fifty-five principal industries use wood as raw material. Their relative importance is hard to indicate, because quantity alone is not in all cases a criterion of value of an industry to the community in which it is situated, nor to the country as a whole.

More than one-half of the total consumption consists of planing mill products, the largest items of which are flooring, siding, ceiling and finishing. The next industry, in point of quantity of wood used, is the manufacture of boxes and crates. Nearly four times as much wood is demanded by makers of boxes and crates as by the builders of steam and electric cars, which come next, and five-fold the amount that goes into furniture, which in turn leads vehicle manufacture.

novelties and supplies for dairymen, poultry keepers and apiarists, and just before handles and musical instruments. About midway down the list comes pumps and wood pipes. Among the products important enough to list separately are canes and umbrella sticks, brooms, firearms, artificial limbs and tobacco pipes.

The apportionment of wood among the various industries, grades from planing mill products, which take most, down to aeroplanes and dry kilns, at the bottom of the list.

TREATMENT AND APPLICATION OF BOILER FEED WATER.

The chief care of boiler owners is the supply of the boiler plant with the necessary water of proper condition. Rain-water is the best of the natural waters. In a descending series of quality we may mention, apart from particular exceptions, the water of rivers, ponds, brooks, springs and wells. The latter one although of clear aspect contains mostly plaster, chalk and salts of magnesia, which make themselves noticeable in the boiler scale deposits.

Original impurities as clay, sand, etc., which can, especially with a lack of filtration apparatuses, get to the boiler, accumulate there very easily. There are removed in the best manner as follows: The boiler is highly fed and the mud blown off by repeated opening and closing of the blow-off valve, till the normal level of water has been attained.

Before putting the boiler out of service it ought to be cooled completely. Thus burning or caking of the mud is avoided, and this can be removed for the greater part by syringing.

There will be more damage to a boiler than advantage if scale of small thickness to about 0.5 mm is removed. Scale of greater thickness is to be removed by knocking off or boring out, avoiding sharp tools.

If the steam is to be used only for power generation, the interior boiler walls can be painted with a mixture of linseed oil and graphite coal tar and graphite. During the last three days before putting the boiler out of service a small amount of petrol can be fed in. This also prevents the sticking of the scale. When using this method it is necessary to take precaution after opening the boiler on account of fire-risk.

The most economical method is the previous removal of the materials which form the scale by adding quicklime, soda, caustic soda or several of these remedies. It is above all necessary to examine the water thoroughly, before reverting to one or another of these remedies and fixing the amount of it. Therefore universal remedies bearing high-sounding names are of no value.

If with smaller plants without special refining plant soda is fed into the boiler, the reaction of the water in the boiler ought to be observed and by repeated partial or entire letting off of the mud an accumulating of soda in the boiler must be avoided. Otherwise packings, fittings, boiler-walls and riveting seams will be affected.

Whilst the scale-formers damage mostly indirectly by raising the fuel costs, fats produced from oil from waste-steam, and also air and carbonic acid will directly affect the boiler walls. Fats ought to be retained in the waste steam main by oil separators. Air and carbonic acid exists in nearly all natural waters and can do harm only in such cases, where they cannot get away with the steam after their getting free in the boiler. By pre-heating of the feed water to about 80° C the greater part of air and carbonic acid will be

driven out, so that these can be separated before entering the boiler by desairation-appliances. The form of the feed-pipe is also of importance. This ought to be mounted into the boiler beneath the lowest water level horizontally and contain lateral holes or slits. The end of the pipe ought to be tapped. By this the water is prevented from flowing in thick streams against the wall of the boiler, on the other hand, the feed water before discharge will be preheated considerably within the feed pipe, so that the free gases can escape at once.

If the holes or slits of the feed-pipe become easily obstructed, the pipe with tapped or closed end can be slitted in its whole length. In such cases, where tapping or closing of the pipe is not practicable, an impact sheet ought to be mounted at some distance from the pipe-end. One or the other of these remedies will be applicable in every case.

SUMMER WEATHER AND PAPERMAKING.

When the hot season of the year begins the paper-maker is confronted with various difficulties, and the Papier-Fabrikant makes reference to the following:—

In open water-courses the algae begin to develop greatly, and these readily pass into the water pipe and stop up the shower pipes. The simplest means to remedy this is to cover all channels and tanks exposed to sunshine.

Cellulose makers notice an undesired increase in the formation of plaster of Paris in the limestone towers and a diminution of free sulphurous acid in the liquor. It is preferable to cool the gas pipes well by means of shower pipes and to diminish the whitening of the outside walls of all liquor tanks and absorption towers with milk of lime, in order to diminish the capacity of absorbing heat and to obtain as low a temperature as possible.

Chloride of lime should be stored in a cool place, protected from the sun and rain.

The rosin casks should also be stored in the shade in order to prevent the rosin flowing. Showers of rain, which together with heat and light, soon render the rosin non-transparent and non-saponifiable, and are also particularly injurious.

Rolls of paper moistened on the paper machine readily dry at the edges and form folds. The moistened rolls should therefore be stored in a cool room on beams about 15 cms high. The floor should be kept moist in order to prevent drying.

The windows of the sorting-room and of the paper stores on the sunny side should be painted on the inside with Spanish white to which a little ultramarine blue is added.

For purifying the waste water it is preferable to add lime.

Coating baths made with animal size readily become acid from one day to the next. This can be prevented by neutralising the fresh coating mass with sodium carbonate; an addition of 150 g. zinc sulphate per 100 kg. coating mass is still better for preventing the fermentation.

For tarring and packing paper the following bath is 35 kg.; rosin oil, 25 kg. In order that it may dry as generally used:—Dry tar, 250 kg.; Norwegian tar, once in summer without smearing having to be feared, the admixture of dry tar should be increased as the temperature of the air increases.

Lastly, it is necessary to carefully control the percentage of moisture of all raw materials entering the mill.

NEW PATENTS

DOUBLE-FACED CORRUGATED PAPER-BOARD AND METHOD OF MAKING THE SAME.

Jeffrey T. Ferres, Inventor.

The invention relates to paper board of double faced corrugated character and the object thereof is to produce a novel and efficient board of this kind and to provide a new and useful method of making the same.

Speaking in general terms, the new board comprises two facing strips and two interposed corrugated strips having their crowns opposed and secured to each other and the method of making such board consists in applying an adhesive to the crowns of the corrugations of two sheets of single faced boards and bringing such sheets together with their crowns in contact.

In the drawing, Figure 1 is a perspective view illustrating the new construction of board; Fig. 2 a plan view of the board during its process of manufacture; Fig. 3 a cross section of the board illustrating a step

2 interposed between the facing strips. Each corrugated strip is secured by an adhesive to its facing strip and the opposing crowns of these corrugated strips are in contact with each other and are secured together by an adhesive indicated at 3.

Describing the preferred method of making this new board, take a sheet of single faced corrugated paper board of any desired or suitable dimensions and slit it in half by means of the slit indicated at 4 in portion of the crowns of these corrugations as indicated at 5. The two half sheets or sections thus produced are then turned or reversed upon each other with the corrugations intermediate, the unslitted portions 5 acting as hinges and also holding the two sections in proper relationship as shown in Fig. 3, with the result that when the two sections or sheets are completely brought together as seen in Fig. 4 the crowns of the opposing corrugations will be in contact with each other with accuracy along their entire length. After the sheet has been slitted in the manner explained and before the two sections or half sheets are folded over, the sheet is passed through a suitable machine of any well-known character for applying paste to the crowns of the corrugations so that when the two sections are folded together as already described the crowns which are in contact will be secured together as at 3. In this manner the completed board is made with the greatest accuracy and uniformity, the proper positioning of registering of the opposing crowns and their securing together being assured.

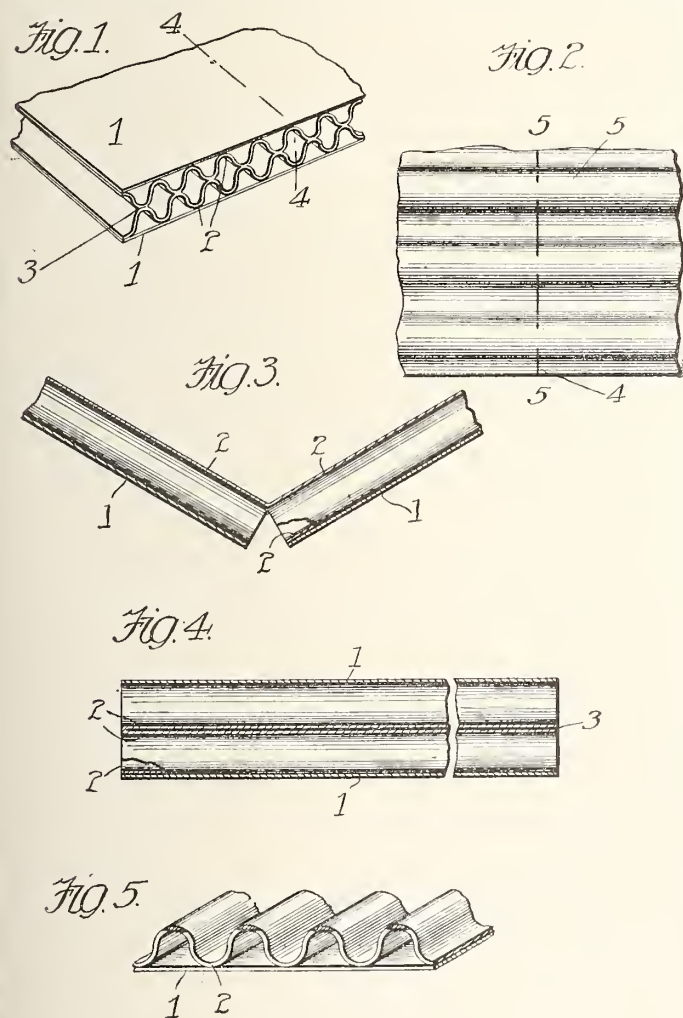
The machine for making the paper is described as follows:

My invention relates to a machine for making corrugated paper and the object thereof is to provide a machine of this general character adapted to corrugate a plurality of sheets simultaneously and to apply to one or more of the sheets before being corrugated a series of strips of adhesive, in order to produce a corrugated board which is stronger than the usual board but yet capable of being properly scored and bent for box construction.

The machine is also adapted to apply a facing sheet or sheets to the corrugated paper board produced in the manner explained.

In the drawings Figure 1 is an elevation of the upper portion of a machine illustrating my invention; Fig. 2 a sectional plan on the line 2—2 of Fig. 1; and Fig. 3 a detailed view on an enlarged scale of the adhesive applying roll.

Referring to the present embodiment of the invention as illustrated in the drawings, the machine has a main frame including the opposite side pieces or frames 1 which support the various working parts of the machine. These side frames are provided with vertical openings or slots 1a within which are arranged the bearing boxes 2—2 of the upper and lower corrugating rolls 3 and 4 between which the paper is corrugated. Below the lowermost roll 4 is a plain roll 5 whose bearing box 6 is vertically movable or adjustable in the opening 1a like the other boxes, the box 6 being vertically adjustable by any suitable means such as the adjusting screw 7 whose upper end is illustrated in Fig. 1. The uppermost box 2 is adjustable by means of the

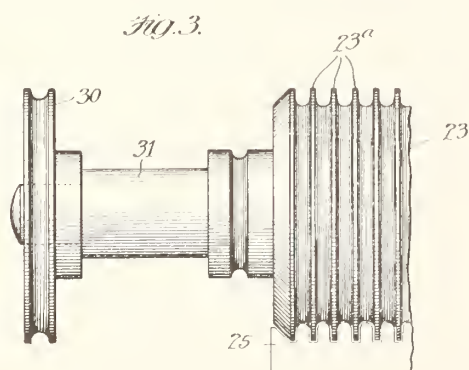
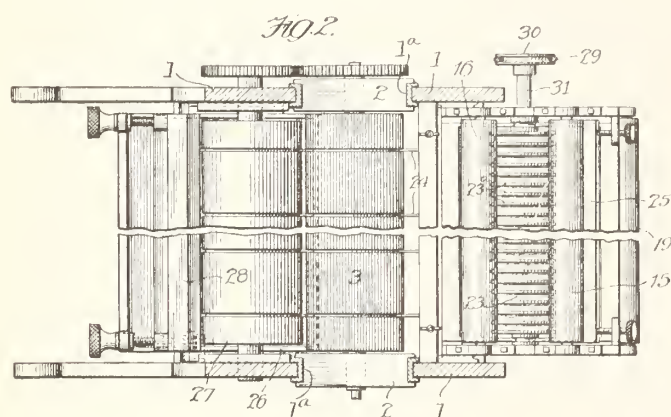


in the process or method of manufacture; Fig. 4 a section on the line 4—4 of Fig. 1 illustrating the completed board and Fig. 5 a section on the line 5—5 of Fig. 2.

Referring to the present embodiment of the invention as illustrated in the drawings, the board comprises the two facing strips 1, 1 and the two corrugated strips 2,

screws 8 whose lower ends engage said box and whose upper ends are screw-threaded through a horizontal cross bar 9 secured to the tops of the side frames 1.

The main frame carries at its upper end, in the present instance by means of the brackets 10 and 11, the rolls of paper 12 and 13. A sheet or strip of paper A from the roll 12 passes over the idler roller 14 and around and under two idler rollers 15 and 16 and thence between the two corrugating rolls 3 and 4, the paper when corrugated then passing between the lowermost roll 4 and the plain roll 5 and being delivered from the machine at this point. The roller 14 is preferably adjustable in suitable manner as by means of the supporting slides 17 which are adjustable in the end frames 1 and secured in place by means of the bolts 18. A sheet or strip of paper B from the other roll 13 passes downwardly and around the two idler rolls 19 and 20 and thence upwardly between the two corrugating rolls where it meets the other sheet A. The two sheets or



strips of paper A and B are thus simultaneously corrugated, and they are at the same time caused to adhere by the adhesive applied to the sheet A in a manner now to be described.

The pan 21 which contains the adhesive is mounted between the side frames 1 upon the ledges or shelves 22 of said frames and in such a position that the adhesive roll 23 will dip thereinto, and supply adhesive to the sheet A as it passes underneath the idler rollers 15 and 16, which rollers are so arranged as shown in Fig. 1 that such sheet will be brought into proper contact with the adhesive roll. This roll is of the peculiar formation illustrated in detail in Figs. 2 and 3, the same being circumferentially grooved so as to provide a series of adhesive applying surfaces 23a.

Consequently the adhesive, instead of being applied over the entire surface of the sheet A, is applied in a series of parallel lines extending in the direction of the line of movement of the sheet. The adhesive is applied to the sheet A before it is introduced between the corrugating coils 3 and 4 so that the corrugating of the two sheets and the pressing of the same together in order that they may adhere are done at one and the same time between the corrugating rolls 3 and 4 and around the lowermost roll 4 and between such latter roll and the plain roll 5. Furthermore the corrugated board thus produced is held in contact with the lower corrugating roll 4 by means of the rods or wires 24. The proper amount of adhesive carried by the roll 23 is regulated by the adjustable scraper 25 and the amount of the adhesive applied to the sheet A is determined by the width of the circumferential grooves in the adhesive roll and consequently the number and width of the adhesive applying surface 23a.

While the machine just described is capable of producing a corrugated board composed of two corrugated sheets, it is evident that three or more sheets can be united as well as the two by simply using additional adhesive applying rolls and additional sheets of paper.

The board produced by means of the machine as thus far described is a corrugated board of the plain or unlined type and used for different purposes. If it is desired to apply a liner or facing strip or strips to this corrugated board, additional paste applying mechanism or mechanisms are incorporated in the machine. For instance, I have shown in the present machine a second adhesive applying mechanism comprising the pan 26 adapted to contain the adhesive, the adhesive applying roll 27, and adjustable scraper 2, the same being mounted and arranged between the side frames. The roll 27 preferably positively actuated is in a position to apply the adhesive to the outer crowns of the corrugated board as it is being carried around by the lowermost corrugating roll 4. The facing or lining sheet or strip which is shown at C comes from a suitable roll (not shown) and passes upwardly over the plain roll 5 and there meets the corrugated board, whose crowns have been supplied with the adhesive in the manner just explained with the result that the single facing corrugated board shown at D is produced. In case it is desired to produce merely the corrugated board, the adhesive roll 27 is backed off from its operative position shown, for which purpose the mountings or bearings of this adhesive mechanism are made adjustable in the side frames as shown.

By preference and as herein shown, the adhesive roll 23 is positively actuated. It may be driven in any suitable manner and as shown it is driven by means of the cross belt 29 extending over the pulley 30 on extended shaft 31 of said roll and over the roller 14 which is itself positively driven in any suitable manner. It will also be understood that the corrugating rolls 3 and 4 and the plain roll 5 are suitably driven, but as the driving connections for such rolls are so common the same have not been illustrated.

As shown and by preference, the scraper 25 is adapted to fit the raised and depressed surfaces of the adhesive roll 23.

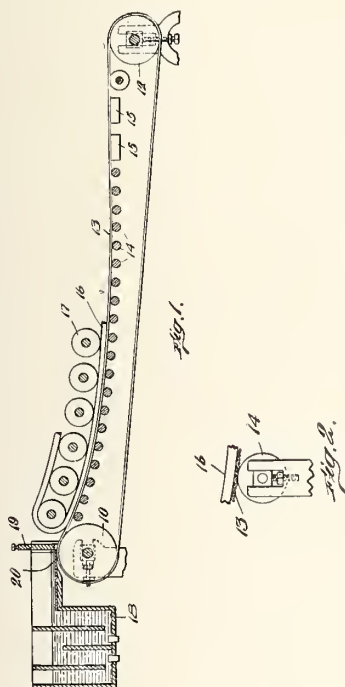
The Inland Timber and Construction Co., Limited, with headquarters in Winnipeg, and a capital stock of one million dollars, has been granted a charter. Among the directors are P. E. Henderson, E. A. Conde, F. E. Taylor and J. A. Ptolemy.

METHOD AND APPARATUS FOR MAKING PAPER.

Leonard B. Buchanan, Woburn, Massachusetts,
Patentee.

No. 1,101,725—Patented June 30, 1914.

This invention relates to Fourdrinier machines, and has for its object to construct and arrange a paper-making wire and its supports whereby the stock is caused to travel by gravity in the direction of movement of the making-wire, so as to attain quickly a velocity equal to the speed of said wire, and then to travel with the wire, aiming to produce a uniform sheet of paper which is strong, even and well-formed. Heretofore an attempt has been made to accomplish this result by raising the breast-roll to such a height that the downwardly moving paper-making wire has considerable pitch throughout its length, causing the stock to travel by gravity, so as to attain a velocity equal to the speed of the wire, but as the pitch continues throughout the length of the wire the stock continues to be affected by gravity throughout the length of the wire and hence moves in advance of the wire, and were it not for the fact that the stock settles on the wire as the water leaves it, so



that its advancing movement relative to the wire is retarded to a considerable extent, no efficient result would be obtained, but as it is, however, the disadvantage due to gravity at the guide-roll end-portion of the wire is more than offset by the advantage gained by gravity at the breast-roll end-portion of the wire, so that on the whole a result is obtained which is a distinct advantage, although the real result sought is not obtained. The angle of the wire really is a compromise, as it does not have a sufficient pitch at the guide-roll end-portion.

I have discovered that it is possible to arrange a paper-making wire, so that it shall have a very steep pitch in front of the breast-roll to cause the stock to move by gravity with considerable velocity, thereby to quickly attain a velocity equal to the speed of the wire, said pitch gradually becoming less steep as the stock gradually attains a velocity equal to the speed

of the wire until it disappears or substantially disappears, and the stock is then caused to proceed by and with the wire and at a velocity equal to the speed of the wire throughout the remaining portion of the wire.

In carrying out my invention the breast-roll is positively driven instead of the guide-roll and that portion of the wire which extends along the under side of said rolls is held taut by the drive, and that portion of the wire which extends along the upper side of said rolls is held slack, thus being deflected below a plane tangential to the breast-roll and guide-roll. The slack-portion of the wire is employed as the stock-carrying portion, and the angle or pitch at different portions of the slack-portion of the wire may be regulated by a novel arrangement of the table-rolls whereby it shall have a very steep pitch in front of the breast-roll, which gradually becomes less and less steep until it reaches a level or any desired angle with respect to a horizontal plane. By thus arranging the wire the stock which passes from the flow-box is moved by gravity at a rapidly increasing velocity, thereby to quickly attain a velocity equal to the speed of the wire, and then its acceleration due to gravitation is gradually diminished as motion is imparted to it by the wire until it is moved solely by the wire, and consequently at the same rate of speed, and as a result the fibers are permitted to settle uniformly on the wire as the water leaves the stock. This result cannot be accomplished by a continuous downwardly moving wire.

Figure 1 is a side elevation of a portion of a Fourdrinier machine illustrating one embodiment of my invention, and Fig. 2 is a detail of an adjusting-means for one of the table-rolls.

10 represents the breast-roll; 12 the guide-roll; 13 the paper-making wire; 14 the table-rolls; 15 the suction-boxes; 16 the deckle, 17 the rolls engaging the deckle for holding it in engagement with the wire; 18 the flow-box; 19 the slice, and 20 the apron, and all of these parts, separately considered, may be constructed in any usual manner, the invention residing particularly in their association and arrangement whereby a new and useful result is produced.

As here shown the paper-making wire 13 is arranged on the breast-roll and guide-roll with its stock-carrying portion between said rolls deflected below a plane tangential to said rolls. This deflection may be obtained easily by driving the breast-roll positively instead of the guide-roll, and causing the portion of the wire below said rolls to be held taut and the portion thereof above said rolls to be held slack. Said rolls may be supported by any suitable forms of adjustable bearings to admit of varying the extent of the deflection. The table-rolls are supported by bearings, which are or may be vertically adjusted, and said rolls are arranged in a novel manner, so that the deflected portion of the wire is regulated to provide for the accomplishment of the desired result. Said deflected portion of the wire is supported by the table-rolls in such manner as to form a curved plane in front of the breast-roll, concave upward, whereby a very steep pitch is produced directly in front of the breast-roll which gradually becomes less and less steep, while the remaining portion of the wire is supported in a horizontal plane or at any desired angle with respect to a horizontal plane, inclining downward or upward. As the stock passes from the usual flow-box it flows down the steep declining portion of the wire at a rapidly increasing velocity, thereby quickly attaining a velocity equal to the speed of the wire, and then its velocity due to gravitation, is grad-

ually diminished as motion is imparted to it by the wire until acceleration due to gravitation ceases, or substantially ceases, whereupon the stock is then caused to travel with and by the wire and at the same rate of speed. By thus arranging the wire the waves and ripples formed on wire in front of the breast-roll quickly subside and the fibers are permitted or caused to settle uniformly on the wire, thus fixing the formation of the sheet in a novel manner.

I claim:—

1. In a Fourdrinier machine, the combination with a positively driven breast-roll, the guide-roll and the paper-making wire passing over said rolls, whereby that portion of said wire which passes over the upper sides of said rolls is held slack and is deflected below a plane tangentially to the rolls, and is arranged with a steep pitch in front of the breast-roll which gradually becomes less steep; table-rolls arranged to support said deflected portion of wire and a deckle arranged for engagement with said deflected portion of the wire, substantially as described.

2. In a Fourdrinier machine, a paper-making wire having its stock-carrying portion arranged with a steep pitch in front of the breast-roll which gradually becomes less steep, thereby to cause the stock to move by gravity at a rapidly increasing velocity to attain quickly a velocity equal to the speed of the wire and then to move with the wire at the same rate of speed, substantially as described.

3. In a Fourdrinier machine, a paper-making wire passing over a breast-roll and a guide-roll and deflected below a plane tangential to said rolls, and table-rolls arranged to support the end-portion of the wire in front of the breast-roll with a steep pitch which gradually becomes less steep thereby to cause the stock to move by gravity at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then to reduce its gravitating force as motion is imparted to the stock by the wire, and to support the remainder of the deflected portion in a plane whereby motion is imparted to the stock by the wire, substantially as described.

4. In a Fourdrinier machine, a paper-making wire having its portion in front of the breast-roll arranged in a curved plane, concave inward, and of such shape that the force of gravity acts upon the moving stock and accelerates it the greatest near the breast-roll and gradually diminishes to nil when the stock attains a velocity equal to the speed of the wire, which is within a distance substantially less than the effective length of the wire, thereby permitting the stock to proceed with and by the wire, substantially as described.

5. In the art of making paper, the process herein described of fixing the formation of a sheet on the paper-making wire, which consists in causing the stock to move forward at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then to continue at a velocity equal to the speed of the wire, so that the fibers are permitted to settle uniformly on the wire.

6. In the art of making paper, the process herein described of fixing the formation of a sheet on the paper-making wire which consists in causing the stock to move forward by gravity at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then gradually reducing the gravitating force until its acceleration due to gravitation ceases and then moving it at a velocity equal to the speed of the wire.

The Life of Wires

The wear of the wire must be considered abnormal not only when many tires are used, but also when the wires have to be mended too early, but nevertheless remain the usual time in the machine.

How long a wire should last can never be stated generally, says the "Papier-Fabrikant." It depends on whether the machine runs quickly or slowly, whether thick boards or thin papers are made, whether it is an old or a new machine, etc. In one mill fine paper was made at a speed of 40m., and the wires ran for five weeks. After increasing the speed to 60m. the wires

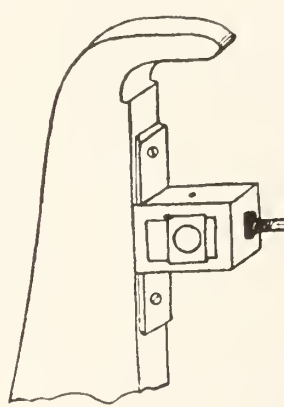


Fig. 1

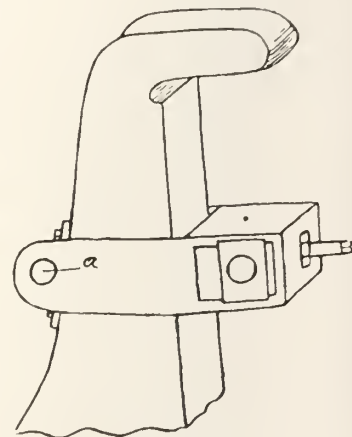


Fig. 2.

ran only three and a-half to four weeks. This shorter life was natural because although the quality was the same an increased quantity was produced. Forcibly driving an already well used wire merely had the effect of rendering completely illusory the initial high output owing to the many stoppages necessary during the last weeks. The consumption of wire was thus normal. In another case an abnormal consumption of wire was met with.

The paper machine in question made in the year 1898 worked up on an average 180,000 kg. with a working width of 140 to 180 cms. and a speed of 20 to 50 m. with one wire in five to six weeks. This is a normal performance of the wire. After some time tears were suddenly seen in the wire on the fourth day, and these spread so rapidly that the wire was unusable after a week. Every thing was done in order to discover the fault, bad bearings and defective tensioning devices were reviewed, but without success. A new wire was wanted every week.

At last the defect was found in the coucher. The upper coucher bearing was constructed as shown in Fig. 1. The trunnion bearing was adjustable horizontally and in addition was guided vertically through a slot. Owing to this guide being worn the bearing was forced away laterally. Rust and pulp fibres which had settled prevented the vertical displacement of the entire bearing, and the couch roll was pressed slantwise on the lower roll. Too great wear of the wire was caused in this manner. New bearings according to Fig. 2 were made. The horizontal displacement of the old bearing was retained, but the vertical displacement was substituted by a rotatable bearing a. This yields to the slightest pressure and cannot jam. After this bearing was erected the wear of the wire became normal again.

Progress in the Manufacture of Sulphite Cellulose

It is recently reported that at the last General meeting of the Society of Chemical Pulp and Paper Chemists, Director Walter Sembritzki of Voitsberg in Steiermark read a paper on "Progress in the Manufacture of Sulphite Cellulose" in continuation of his communications in the year 1909.

A graphic description was given of everything new and worth knowing which had been done during recent years in the art of making sulphite cellulose; the information was closely connected with the manufacturing operation, so that it was easy to follow the interesting paper.

It is to be emphasized that at the present day a consumption of only 19—21 kg. fine pyrites per 100 kg. chemical pulp is reckoned as compared with larger pieces of pyrites in quantities of 50 kg. formerly. The difference is for the most part due to the new system of kiln and mode of working.

When comparing mills which work with sulphur with those which work their plant with fine pyrites it is found that the latter have a saving which amounts to 170,000 Marks per annum in the case of a 100 ton plant. This is rather too small if anything, for the consumption of sulphur is frequently higher.

Instead of the wooden towers armoured with large wooden scaffolds and anchors, one sees masonry towers surrounded by strong iron scaffolds.

Centrifugal pumps have superseded the old piston pumps for all purposes.

Supplying chemical-pulp digesters with steam of low pressure has proved better in every respect than reducing the pressure of high-pressure steam.

Suction draught plants or smoke-stacks! This is a matter of dispute. At any rate one must examine each case on its own merits as to which plant is the more suitable.

At present not much direct use can be made of turbine steam for digesting. The tests are not yet concluded. In any case it is more economical to be able rationally to use the pressure in the turbine and then the temperature of the same steam in the digester.

The endeavours constantly to increase the yield from the digesters have led to new apparatus which are able to fetch an average of 95 kg. chemical pulp out of one cubic meter of charging space.

For the conveyance of the pulp grabs are employed which are exceedingly effective.

In connection with the utilisation of the waste wash great progress has not been made. One must still always reckon on a loss of 50 per cent. in the dry weight of the wood which passes as organic matter into the waste wash.

The procuring of timber requires, as before, the greatest attention.

Very valuable hints were given with regard to the starting of chemical pulp mills. The experience obtained from extensive practice will be of good service to many and will also open the eyes of many as to the enormous expenditure of capital which is necessary in order to erect a modern plant capable of meeting all the requirements which are placed to-day on such an undertaking.

CLOSER UTILIZATION OF STUMPAGE.

In a recent statement, Prof. R. C. Bryant, of the Lumbering Department of the Yale Forest School, shows that the extent to which close utilization of stumpage can be effected is dependent directly on the markets and the prices which can be secured for the low-grade material, which comprises more than 50 per cent. of the lumber cut. The lumberman removes from the forest only as much of the stand as he believes can be marketed at a profit, although every defective log may contain some cull material which must be handled in order to secure the higher grade lumber on which a profit can be made. The past few years have seen a marked change in the character and amount of timber which is taken from a given acre of land. Where formerly only the choicest trees and the best logs from these same trees were taken, lumbermen have now reached a point, due to higher stumpage values and increased market prices for lumber, where, in some sections the entire stand is removed, down to a diameter of from 12 to 14 inches, in some cases still lower; also where low stumps are cut and where defective and knotty top logs are taken to the mill. The yield per acre for stands of the same character has increased from 400 to 500 per cent. for the above reasons.

From the above, it will be seen that a comparison of the cut from a tract of land 20 years ago with the cut from the same tract to-day does not necessarily furnish any index to the amount of growth which has taken place during that time. This is due to the lower diameter limit in use, and the much closer degree of utilization. Unless full allowance is made for these factors a land owner is likely to conclude, from a comparison of cuts, that the rate of timber production on his land is much greater than is really the case. As a matter of fact, tree growth must be measured; it cannot be estimated. This is one of the tasks for which a forester is trained. It is beyond the scope of the timber cruiser.—Conservation.

FIRE PREVENTION ALONG RAILWAYS.

According to the Fire Inspection Department of the Board of Railway Commissioners, the railways throughout the country are doing very much better this year in the matter of fire protection than they have ever done before. There has been closer compliance with the requirements of the Board, and a far greater degree of co-operation between the various agencies interested in fire prevention. In particular, the railways are co-operating much more closely than previously with the fire protective organizations of the Dominion and Provincial Governments. The situation has also been greatly improved by the increase, in number and strength, of lumbermen's co-operative fire protective associations, of which there are now two in the Province of Quebec, protecting a total of nearly 14,000,000 acres.

In the past railways have been regarded as one of the principal causes of forest fire destruction. This situation is now being rapidly changed, due to the increasing care given this matter under the requirements of the Railway Commission. The fire hazard is being reduced by the expenditure of large sums by railway companies in disposing of inflammable debris on rights of way. Great care is taken to keep the spark arresters on locomotives in good order. Through the more dangerous sections, special fire patrols are maintained, and everywhere railway employees have received special in-

structions regarding the reporting and extinguishing of fires in the vicinity of the track.

Reports received by the chief fire inspector of the Board indicate that, to a very much greater extent than in previous years, the fires in the vicinity of the railways have been adequately handled by the railway employees and that most of the serious fires reported as occurring in May originated at a distance from the railways, frequently as a result of settlers' slash-burning operations.

BATHURST LUMBER CO.'S STOCK INCREASED.

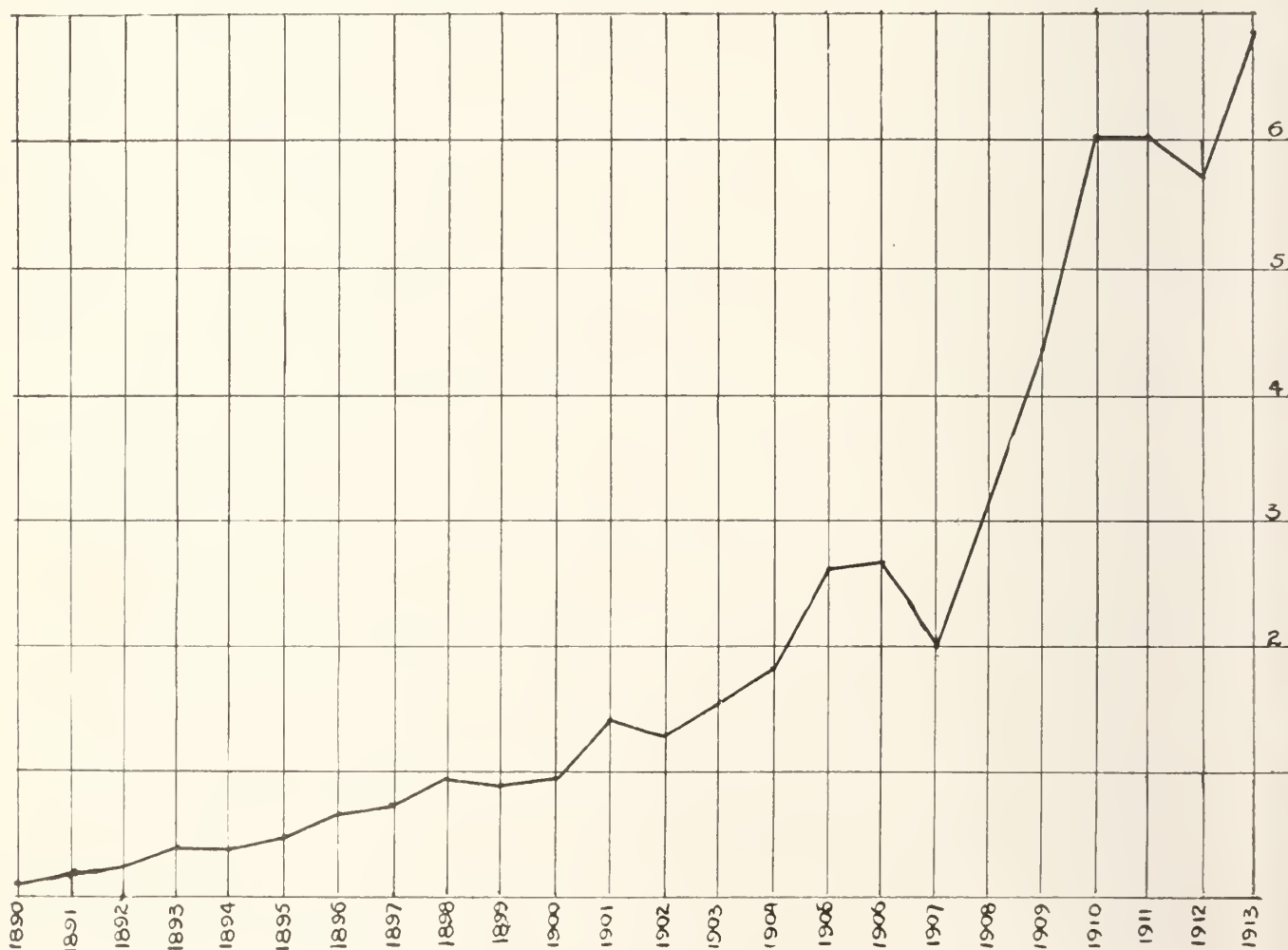
Supplementary letters patent have been issued under the Seal of the Secretary of State of Canada, bearing date the 17th day of June, 1914, increasing the capital stock of the "Bathurst Lumber Company, Limited," from the sum of one million dollars to the sum of five million dollars, such increase to consist of forty thousand shares of one hundred dollars each.

DOMINION LUMBER CO. IS BANKRUPT.

Toronto, July 3. The master in ordinary to-day appointed Frank Denton, K.C., joint liquidator of the Dominion Lumber Co. at the request of the Great Lakes and St. Lawrence Transportation Company. The Dominion Lumber Company has large timber and pulp limits in the province of Quebec.

Forestry is the art of utilizing the forest and at the same time perpetuating it. It is wholly utilitarian; it has nothing (except incidentally) to do with the esthetic aspects of forest growth which concern the landscape gardener. Wood-crops is its object, just as food-crops is the object of agriculture. The only obligation which forestry imposes in the use or harvest of a forest growth is to systematically replace the harvested crop. In this obligation mainly, if not alone, does forestry differ from lumbering.—Fernow.

Canadian Pulpwood Trade



Exports of Pulpwood Blocks, 1890-1913,
in millions of dollars.

PULP AND PAPER NEWS

The Don Valley Paper Co., Limited, Toronto, have removed their city offices from 36 Toronto Street to the seventh floor of the new Dominion Bank building, where they have a fine suite of apartments.

Barclay Single Mills, Ltd., is the name of a newly-incorporated company incorporated with a capital of \$25,000 to take over the Port Haney Lumber Co., Ltd., and carry on a general lumbering business.

The Guildford Island Lumber Company, head office, Wilmington, Del., has been registered under the Companies' Act in British Columbia, to carry on a general lumbering business. The capital of the company is \$500,000.

At the annual meeting of the Wayagamaek Pulp and Paper Co., which will be held at Three Rivers, Que., on July 16, the annual report will show that the past year's business has been very good and that the bond interest and all charges have been met and, after all deductions, a fair percentage on the common stock. There are \$3,500,000 bonds and \$500,000 stock outstanding of the company.

The American Wood Working Machinery Co., a corporation created under the laws of Pennsylvania, has taken out a license to do business in Ontario and is empowered to invest the sum of forty thousand dollars in carrying on operations in the province. Wm. Garlock, jr., Toronto, has been appointed attorney of the company for Ontario.

The Toronto office in the Tyrrell Building, King Street East, of the Spanish River Pulp and Paper Mills, has been closed and the staff removed to the headquarters of the company at Sault Ste. Marie. Wm. Hurlbut, assistant traffic and sales manager of the company, is now located at the Soo. John G. Sutherland, sales and traffic manager, will, however, continue to reside in Toronto.

Emanuel Bernhardt, an employee of the Ontario Paper Co., at Thorold, Ont., was caught in a pulley of the shafting in the mill last week and received injuries which proved fatal. Two arms and a leg were fractured and he sustained serious injuries about the head and body. Bernhardt was removed to the General and Marine Hospital, St. Catharines, where he passed away shortly after.

Three young men, who have had wide and varied experience in paper and pulp mill engineering as well as specializing in other lines of work have formed a partnership and opened an office in the Confederation Life Building, Toronto. They are M. C. J. Billingham, W. A. Newton and W. D. Cook, the firm being known as Billingham, Newton and Cook, engineers and architects. Mr. Billingham is a former manager of the Canadian office of Dr. J. Albertson and for the past year was in charge of the head office in Kalamazoo. W. A. Newton has been manager of the Canadian office of Mr. Albertson for some time, and Mr. Cook was also connected with the same firm in Kalamazoo. Many friends in the trade will wish them success in their new enterprise.

An injunction was sought last week against the Canadian Ladies Home Journal, of Toronto, by the publishers of the Ladies Home Journal of Philadelphia, to restrain the former publication from using the present title. Chief Justice R. M. Meredith declined to grant the injunction against the Canadian publishers. The trial of the action will come up in the fall.

All the travellers, warehousemen and office staff of the Victoria Paper and Twine Co., Limited, Toronto, were entertained to a delightful trip on Saturday, July 11 by Charles V. Syrett, Manager of the company, when a visit was paid to the Garden City Paper Mills at St. Catharines. Afterwards a motor ride was enjoyed to Niagara Falls and return. The outing was one of both education and pleasure. At the Garden City Paper Mills, the visitors were warmly welcomed by L. H. Gardner, President of the Company and the other officers and shown through every part of the modern plant.

The Interlake Tissue Mills of Merriton, Ont., are still adding many novelties to their output. Last week they put on the market sealed packages, pocket size, of White Cross toilet tissue for the use of motorists, hunters and fishermen, which are meeting with a ready demand. Three rolls of Sani-White crepe tissue in attractive glassine packages is another novelty, while in the various lines of crepe paper towelling that the company turn out the rolls are all sealed at the end preventing dust and dirt getting in. Explicit directions are printed on each cover on the proper way to use paper towels. The demand for them is growing rapidly and particularly since more persons are learning how to use them without waste.

The products of the St. Lawrence Paper Mills Co., Limited, whose mills are at Mille Roches and Thorold, Ont., and the products of the Barber Paper and Coating Mills, Limited, at Georgetown, Ont., are now being sold under the name of the Provincial Paper Mills Co., Limited. All shipments applying on orders and contracts held by the old companies are invoiced by the Provincial Paper Mills Co., Limited, the charter for which was obtained several months ago. The head offices of the company are in Toronto.

The paper machine in the Don Valley Paper Co., Toronto has been equipped with granite press rolls as supplied by Bertrams, Limited, Seimens, Edinburgh.

Extensive alterations have been carried into effect in the Merriton plant of the Riordon Pulp and Paper Co. All the digesters have been relined, additional serews have been installed, a new cement floor laid and a cement roof placed on the main buildings. The former portion of the plant, devoted to making hanging paper which was discontinued about a year ago, has been converted into a screen and press room. The efficiency of the equipment has been thoroughly looked after and the output of easy bleaching sulphite pulp has been augmented by about fifteen per cent. At Hawkesbury the company has also put up another

building and added a third drying machine, giving a drying capacity of about one hundred and twenty tons per day.

An appeal will be entered to the Privy Council by the Federal Government from the judgment of the Supreme Court of Canada, that a company, operating under a provincial charter, is not confined to its own province. Much interest will be taken in the outcome by many pulp and paper concerns in the Dominion. The financial stringency has had a marked effect upon the number of federally incorporated companies in Canada during the last fiscal year, there being a decrease of 181. During the last fiscal year the number of companies chartered was 758 with a total capital of \$425,307,569, and in the previous year there were 939 new companies chartered with an aggregate capital of \$680,762,199.

The Board of Trade, Toronto, will move into new quarters on the completion of the twenty-storey Royal Bank building, which is the tallest structure in the British Empire. They will occupy the entire nineteenth and twentieth floors, which will be elaborately fitted up. W. P. Gundy, who is Vice-President and Managing Director of the Kinleith Paper Mills and W. J. Gage Co., is President of the Board of Trade.

At a meeting of the Ontario Medical Council in Toronto last week, some criticism was offered by the members of the new Ontario Workmen's Compensation Act, in that the act, as finally passed, makes no provision for the payment of the doctor's fees for attendance on the injured workman out of the compensation. The physicians feel that this should be done and, during the last session the Ontario Government was interviewed, but the medical men did not succeed in having the stipulation made. In the meantime the doctors will keep up the agitation to have such a clause included in the act.

At the annual meeting of the Canadian Press, Limited, held in Toronto last week J. F. MacKay of the Toronto Globe and J. E. Atkinson of the Toronto Star retired respectively from the offices of President and Secretary, which positions they have held for the past four years. E. F. Slack, of the Montreal Gazette, was elected President; E. H. Macklin of the Winnipeg Free Press, First Vice-President; W. J. Blackburn, of the London Free Press, Second Vice-President, and John Lewis of the Star, Montreal, Secretary-Treasurer.

The Standard Paper Co., Toronto, have been appointed agents for Canada for a waterproof board made in Sweden. It is put together with a waterproof paste and the board can be left in water and so absolute are its wet resisting qualities that no effect is made on the board.

HALF A MILLION IN JUDGMENT.

According to the judgment handed down by the Court of Review of Quebec, the sum \$500,000 will go to M. J. O'Brien, of Renfrew, Ont. Mr. Rainboth, of Ottawa, some time ago pleaded for a quarter interest, in timber and pulp wood limits, worth \$2,000,000, which were acquired by Mr. O'Brien of Renfrew, and himself, by private sale from the Provincial Government. When Mr. Rainboth entered suite two years ago, before the High Court, a decision was reached that the agreement between the two parties was at an end, and of no effect. The Superior Court maintained the action and declared that Mr. Rainboth was entitled to his one quarter interest. Now, however, the Court of Review supports the claim of Mr. O'Brien.

Personals

G. C. Winlow, of the Canada Paper Co., Toronto, has returned from a business trip to Chicago and other western cities.

Mr. Hagar of Lilla-Edets, paper manufacturers, Sweden, was in Toronto and Montreal last week calling upon the trade.

J. Smith, representing the Wrenn Paper Co., of Middleton, Ohio, was in Toronto and other Ontario cities last week on business.

E. W. Tobin, and F. N. McCrac, of the Brompton Pulp and Paper Co., East Angus, Que., were in Toronto recently on business.

J. F. Ellis of Barber-Ellis, Limited, Toronto, who is President of Barber, Ellis, Davis, Limited, Calgary, has been on an extended trip to the West.

Howard Hitchcock, representing the Eaton, Dikeman Co., blotting paper manufacturers, Lee, Mass., was in Toronto and other Ontario cities last week on business.

B. Webster, representing Edward Lloyd, Limited, papermakers, London, was in Toronto and Montreal last week on business. He also covers India and China for his firm as well as Canada.

T. H. Watson, formerly President and General Manager of the Spanish River Paper Mills, Limited, Toronto, is now President of the Canada Machinery Corporation, and has his office in Galt, Ont.

G. A. Howell of the Howell Trading Co., Toronto, has returned from a business trip to Grand Rapids, Kalamazoo, and other points in Michigan, and reports that business in the pulp and paper line is improving somewhat.

W. P. Ryrie, General Manager of the Becker Co. of America, Limited, who was recently in London, Eng., attending the annual meeting of the company, has returned to Toronto after an extended visit to the Eastern States.

NEW CRANE BULLETIN.

Bulletin B. 7 has just been issued by the Herbert Morris Crane and Hoist Company, Limited, and a copy has been forwarded for our inspection.

This bulletin is devoted exclusively to the Morris Tyne S. 1 Hand Operated Overhead Travelling Crane, which is a very light crane, designed in various sizes up to one and a half ton.

By making all the main parts of rolled-steel sections the weight of the crane itself has been kept very low, thus avoiding that disproportion between the dead weight and the live or useful weight which is so often a discouraging feature of all Overhead Travelling Cranes.

Page 3 is a very interesting feature of the bulletin, describing as it does a large number of alternative constructions of the lifting gear, which are available for use under the varying conditions which are to be found in the many different factories in which this type of crane can be used to advantage.

Copies of the bulletin will be furnished on request.

When fire protection becomes a matter of the individual responsibility of the citizen, then, and not till then, may a reduction in the enormous fire loss in Canada be expected.



The Markets

CANADIAN MARKETS

The general tone of the news market continues good and a steadily increasing demand is reported from across the line. Of course, very few contracts are being placed just now but most mills have practically all their output covered for some time to come. In fact, nearly all members of the trade are of the opinion that, during the present depression which has continued for some months, the news print plants have suffered less than any other branch of the business. Those who seem to have felt the drawback the most are wrapping paper mills. Book and writing plants are doing a fair business, although some price cutting is reported in the extra fine class of writings in order to secure orders. In ground wood the situation is dull and the business is confined to regular shipments on contract requests from consuming centres. Water conditions have not improved with many of the plants in Quebec, and about the highest price obtained is \$22 to \$23 delivered, varying according to freight rates. There are rumors in the trade of some sales being made at exceptionally low figures in order to keep the grinders moving. Chemical pulp is holding up very well, although prices are a trifle easier than in the spring. Board mills are rather quiet but tissue and toilet concerns are kept going nicely as the demand for crepe articles in the way of table coverings, napkins, paper towels and other specialties is always good at this season of the year when camping and picnics are popular pastimes. Very good business is reported in the specialty line. The rag and paper stock market is weak and no improvement is looked for before the fall months. Paper houses report that the turn over for June was very good on the whole, although stocks are low, and there is a strong disposition to limit buying to small quantities. In most Canadian cities building has not been as active as last year, and roofing and building papers are in poor demand, while values in kraft papers are weak. Following are the prevailing quotations f. o. b. Toronto:

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.20 to \$2.50, depending on quantity.
 New (sheet), \$2.05 to \$2.15 at mill, in carload lots.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.56½ to \$3.25.
 Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$15.50.

Ground Wood, \$20 to \$23.

Sulphite (unbleached), \$41 to \$42, delivered in Canada.
 Sulphite (unbleached), \$42 to \$43, delivered in United States.

Sulphite (bleached), \$55 to \$56, delivered in Canada.
 Sulphite (bleached), \$56 to \$57, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 87½c to 90c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 27½c to 30c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinets, 70c to 72½c.
 Flock, 80c to 82½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.
 On large orders to the jobbing trade some manufac-

turers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine.)

London, July 3, 1914.

Business in the British paper industry shows very little improvement, and unemployment shows also an increase when compared with this time last year. The energies of paper manufacturers for the past six weeks have been taxed to their utmost capacity in efforts to rid themselves of the large stocks they have on hand, and, whenever possible, price-cutting has been resorted to so as to counteract the sale of foreign papers and relieve the present dull situation. It is now nine months since the British paper manufacturers have fallen into this dull period and it is principally the export trade that is suffering mostly. On export account there appears to be very little new business passing and were it not for the supplies being delivered under contracts, or in accordance with old standing agreements, the outlook would certainly be very gloomy. The domestic demand is only fair—just sufficient to keep most of the mills from shutting down machinery. Fine writing and printing papers are having a fair outlet, but newsprint still keeps in the background at 3 and 4 cents per lb. and probably a small discount off. Packing and wrapping papers are passing off freely, and so are esparto papers, the demand for which has all along been satisfactory, but the cost of production very unsatisfactory to mill owners.

* * *

Moist ground wood, or mechanical pulp, is still in a moribund condition so far as market conditions are concerned. Producers and importers, however, are very firm in their quotations. There are reports in London that the Germans are enquiring in the Scandinavian markets for ground wood, owing to the low water conditions in the "Fatherland." Scandinavians also complain of low water, and if there is no immediate improvement it may safely be stated that prices will harden in London, as well as in Scandinavia. Prices are now about as follows c.i.f. British ports:

Pine 50 p.c. moist, prompt (unwrapped) \$8.00 to \$9.50
 Pine, dry, prompt 19.20 to 19.50

* * *

In sulphite only prompt dealings are engaged in and prices are on a lower basis. Sulphate has exchanged hands for next year's delivery at current values, but the amount of business done on the whole has not been very great. Soda kraft is unchanged and dull. Deliveries are arriving in large quantities under contracts and stocks at mills are large. Scandinavian reports state that business is very quiet. Prices are now about as follows, c.i.f. British ports:

Bleached Sulphite \$54.00 to \$59.60
 Easy Bleaching Sulphite (No. 1)... 38.40 to 40.00
 News or strong quality 36.20 to 37.00
 Unbleached soda (No. 1) 36.00 to 37.00

Unbleached soda (strong quality)... 36.60 to 37.90
 Soda Kraft 34.00 to 37.00

* * *

Trade in esparto is fair, but sellers are firm and inclined to advance prices on prompt deliveries. Values at present show no sign of reaching a lower basis. Rags of all descriptions are experiencing a poor trade, owing to the dullness in the paper industry, and prices are easing somewhat.

* * *

A fair amount of business is passing in chemicals. caustic soda is \$48.60 for 77 per cent, and \$48 for 70 per cent.; bleaching powder is \$27; ammonia alkali, \$20 for 58 per cent.; soda crystals, \$9.90 to \$10 per ton; salteake, \$9.90; alum, \$28 to \$29 per ton for lump and about \$4 extra for ground; sulphur \$26 per ton. In filling and loading minerals contracts are now being made for 1915 on the same basis as the 1914 contracts. Mineral white, gypsum and other such like fillings are unchanged and dull.

NEW YORK MARKETS.

(Special to Pulp & Paper Magazine.)

New York, July 11, 1914.

The situation in the local ground wood pulp market is essentially without change in the interval. Some manufacturers report that they have contracted for about 25 per cent more than their total output. This excess contract was made for the purpose of meeting the falling off in consumption due to requests to suspend shipments that occur from time to time. Others report a fair number of inquiries for new contracts, but only a few coming to closed transactions. Old pulp has been fairly well sold out by a number of manufacturers, and others have entirely moved the large piles that were stored at grinding centers during the period following the Miami Valley disaster. At present grinders are holding firm to \$16 at the mill for fresh pulp.

The quotations on foreign chemical fibres have remained practically unchanged. A few contracts for unbleached sulphite pulp were reported in the interval. The price being about 182½. Bleached sulphite is in poor inquiry and the present quotation of 2.55 to 2.65 is for contracts covering the current year only. It is said that better values can be had in deals covering 1914, 1915 and 1916, or even covering this year and next. Sulphate and kraft pulp are in poor demand and values are weak.

Rags and bagging have reflected an uneventful market. Mills make large rejections of locally collected rags. This situation is probably due to the fact that prices are very low and dealers cannot afford to make very close sortings of the automatically baled rags that are collected from the apartment houses and hotels. All kinds of trash are thrown into the baling machine as the machine will bale anything.

The demand for old waste papers has been rather poor in the interval. Most activity has been in flat stock as book mills have been more active than any other consumers of old papers. There are fairly good supplies of white shavings on hand, which are quoted at \$2.30 to \$2.40 a hundred pounds for high grade hard shavings. Soft shavings are quoted at \$1.75 to \$1.85 for No. 1 whites and 75c to 85c for high grade colored shavings. Heavy magazines are selling at 85c to 90c, and ledger stock at 1.40 to 1.45. The demand for old papers is poor and values are rather weak.

Pulp.

Ground Wood, No. 1, \$19 to \$23, delivered.
 Ground Wood, No. 2, \$15 to \$17, delivered.
 Unbleached sulphite, dom., 1.90c to 2.00c delivered.
 Unbleached sulphite, imptd., 1.82½ to 1.95c, ex dock, New York.
 Bleached sulphite, domestic, 2.75c to 2.90c, delivered.
 Bleached sulphite, imptd., 2.60c to 2.70c ex. dock, New York.
 Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.
 Unbleached sulphate, imptd., 1.75c to 1.85c, ex. dock New York.
 Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
 Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

There has been a noticeable improvement in the demand for practically all grades of paper. Jobbers' stocks had been allowed to run down until it was necessary to lay up stocks in order to meet the demands of consumers. This situation has brought about a great deal of very keen competition among mills in order to get the orders. It has led to more or less price cutting in practically all grades as jobbers would realize that there were so many anxious salesmen at hand that they felt some would have to cut the price to induce them to buy. Several days ago there was some alarm among the book paper manufacturers when it was reported that an M.F. had been offered at 3½c. Investigation revealed the fact that the paper was of very inferior quality, and that 3½c was a fair price for it. The paper resembled a white news. Another cut that caused more or less of a sensation was that made by a jobber who, it was said, had sold three cars of a high grade imported kraft at 3½c. There has been a healthy demand for newsprint. Some of the large metropolitan dailies have increased the size of their rolls and this has aided the consumption from the point of view of tonnage as no decrease in the number of pages has been noted. Sheet news is in fair demand at 2.20c f.o.b. New York. Side runs have been in good demand, owing to the opening of summer resorts where large shipments were delivered. The price in the local market was 2.05c for 12 and 15 inch rolls and 1.95c to 2c for 9 and 18 inch rolls. Activities in book papers is a little more acute than for the past two months, as magazines and publishers are now preparing to make their contracts for fall delivery. Manilla and fibre papers have been in rather poor demand in the interval, as have boards and prices rather weak. Strawboard has been freely quoted in the local market at \$26 a ton. Newsboard is in fair demand, only at \$30, which is \$1 a ton less than the price quoted during March and April. The tissue market is still rather quiet. It is reported that some manufacturers contemplate an advance in the price of No. 1 white to 42½c a ream on ear lots. The demand for paper bags has been fair, but prices have been weak in New York. Under an increasing demand there is a little firmer tone to paper bag prices at present. Roofing and building papers have been in poor demand owing to the small amount of building this spring. Present quotations are about \$32 for regular felts and \$33 for slaters. Asbestos paper is now quoted at \$32 a ton. Specialties are in fair demand. Paper towels, toilet papers and paper cups have enjoyed good inquiry, and have commanded fair prices.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.

News, side runs, 1.95c to 2.05c.
 News, sheet, \$2.20 to \$2.30 f.o.b. New York.
 Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 4¾c to 5c, delivered.
 Manila, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$26 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42½c f.o.b. New York.
 Tissue, fourdrinier, 47½c to 50c f.o.b. New York.
 Tissue, jute Manila, 40c to 41½c f.o.b. New York.

THE SWEDISH WOOD PULP TRADE.

Mechanical pulp. There is a firmer and more confident tendency in this market on account of reports about low water and chances of reduced output at some of the large mills. Any marked increase in prices has, however, so far not been registered.

Sulphite. Sales are still mostly for small parcels and prompt delivery, but as we mentioned in our previous report there are also inquiries in the market for delivery during the next and the following years, but no business has, so far, been effected.

Sulphate. We have been informed that a large contract has been closed for delivery during next year for kraft-pulp at £7 5s 0d f.o.b. incl. customary agents commission and discount, which must be considered a very favorable price for the seller during the present situation on the sulphate-market.

—Affarsvarlden, June 17th.

FIRE RAGING ON ISLE OF ANTICOSTI.

Southwest Point, Anticosti Island, July 13.—For several days a fire has been raging in the bush near Ellis Bay, Anticosti, and has now extended to a width of five miles. Already great havoc has been wrought in the pulp wood area, about seventy thousand logs having been burned, the loss on which will run into thousands of dollars.

All the available men in the district are fighting the fire, but with little success. There seems, however, to be little danger to the town of Ellis Bay at present, though it is feared that the fire may continue until a heavy rain comes, and if high winds should occur at any time, the situation might become very serious.

At Ellis Bay there are large mills for cutting the pulp wood into merchantable sizes, and during the summer season a lake steamer is loaded almost every day and the cargo taken to Oswego and other lake ports. The whole island is exploited for its pulp wood by the Anticosti Company, of which the late Henry Menier was proprietor.

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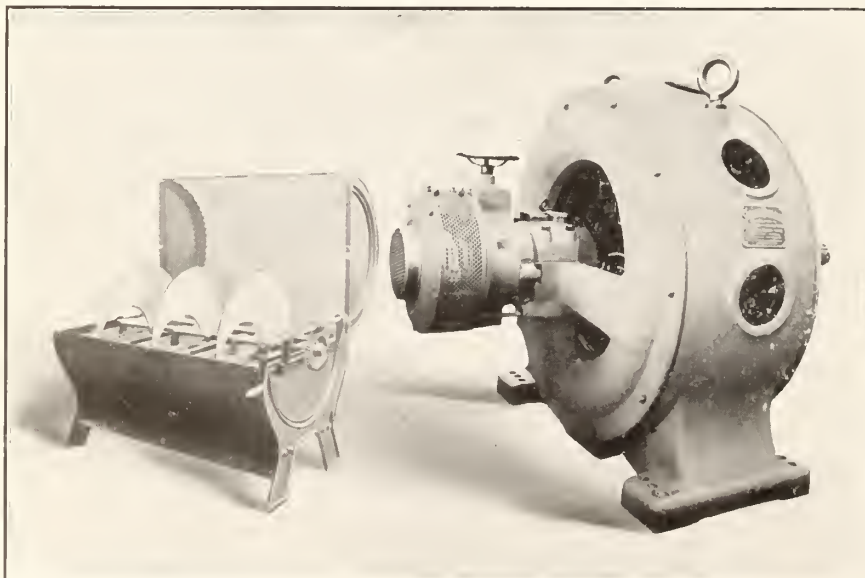
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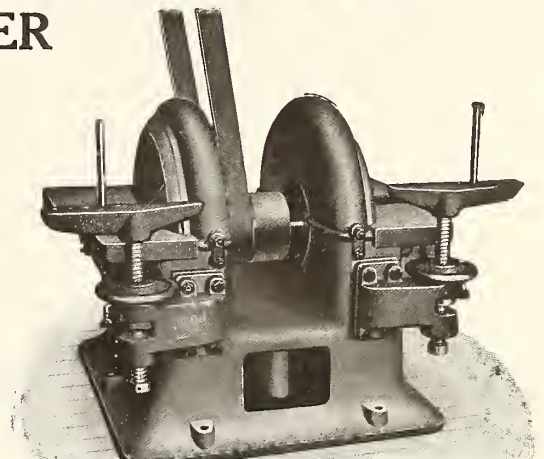
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"	" 186 River Saumon & Tribut River St. Jean	..	..	34
"	" 187 River Magpie, No. 3	..	..	32
"	" 188 River Magpie, No. 4	..	..	32
"	" 189 River Magpie, No. 5	..	..	32
"	" 190 River Magpie, No. 6	..	..	32
"	" 191 River Magpie, No. 7	..	..	32
"	" 192 River Magpie, No. 8	..	..	32
"	" 193 River St. Jean, No. 1	..	..	24
"	" 193 River St. Jean, No. 2	..	..	24
"	" 194 River St. Jean, No. 3	..	..	23
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"	" 196 River St. Jean, No. 5	..	..	20
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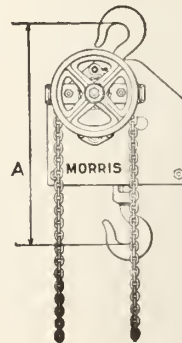
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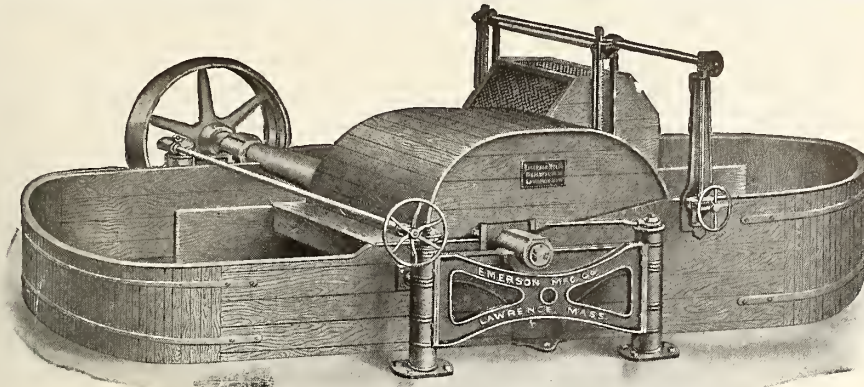
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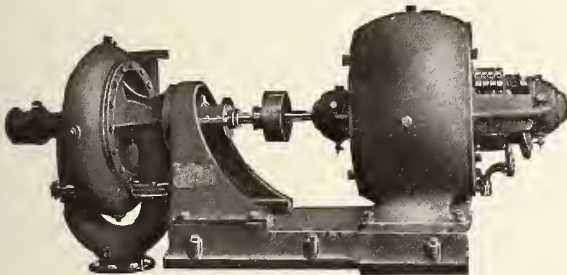
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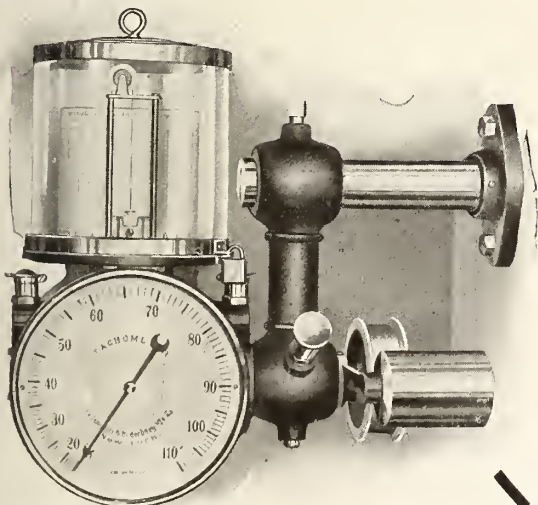
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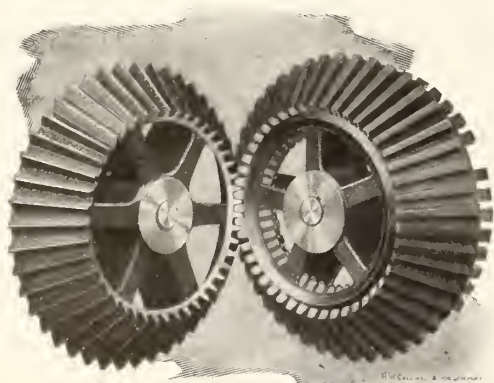
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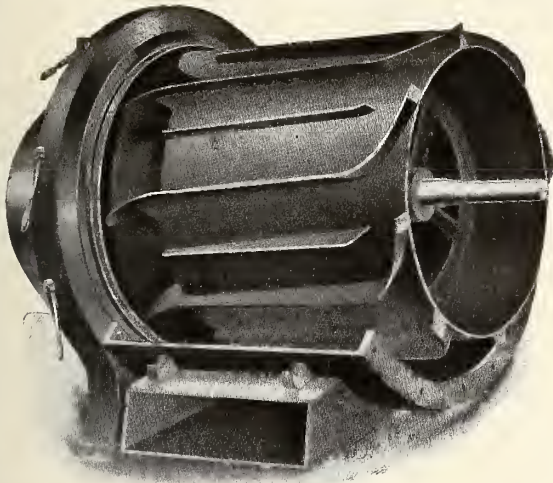
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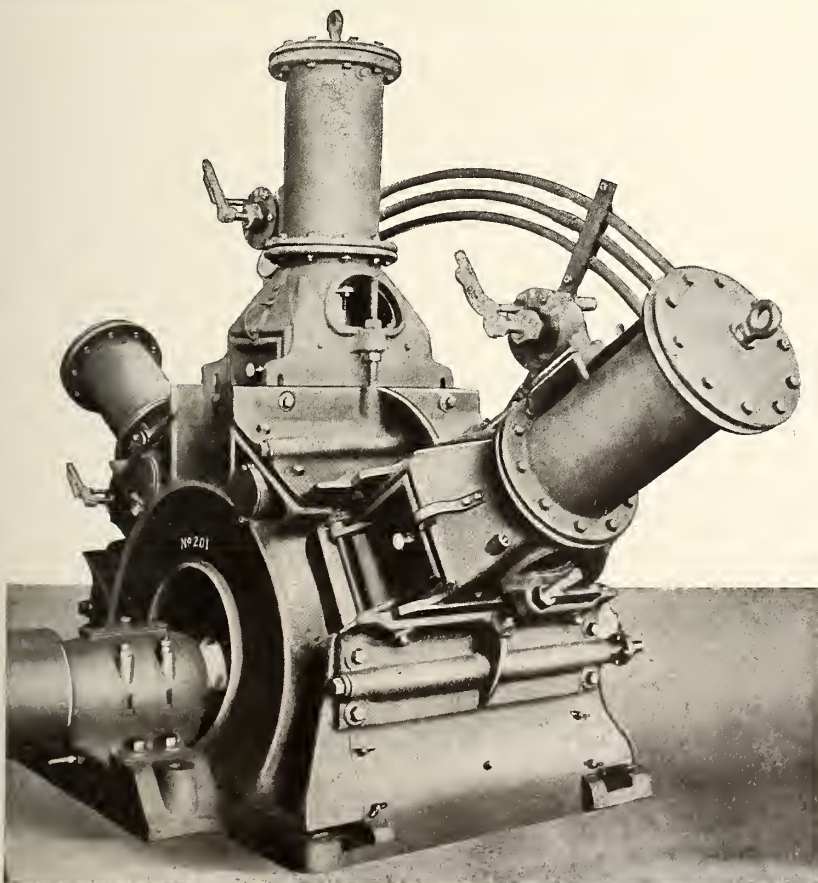
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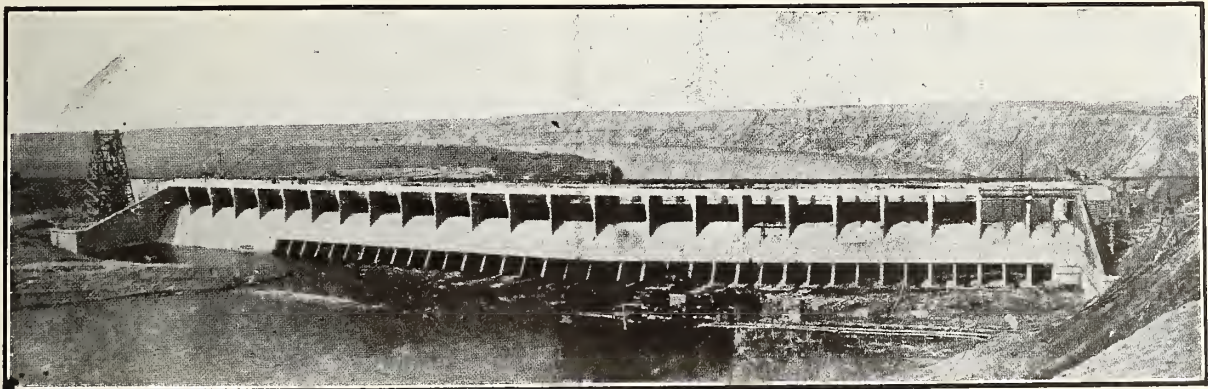
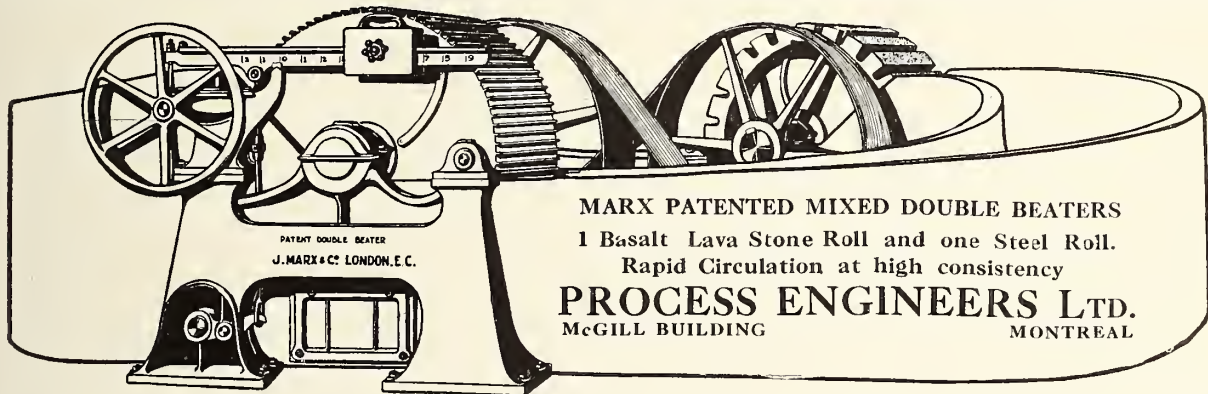
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Walker, J. R. & Co., Montreal, Can.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd. Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alls**
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J. London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Tanks**
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works, Montreal, Can.
- Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Transmission Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto.
Jones & Glassco, Montreal, Can.
- Traveling Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Trolleys**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

- Turbines**
 Boving & Co., of Canada, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M. Co., Inc. New York, N.Y.
 Voith, J. M., Wurttemberg, Germany.
- Water Strainers**
 Jensen og Dahl, J. & A., 1 Broadway, New York City
- Water Wheels**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Hamilton, Wm. Co., Ltd., Peterboro, Can.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M., New York, N.Y.
- Wire Cloth for Paper Machines**
 Chambers, Ltd., Toronto.
 Christie, Geo., Ltd., Glasgow, Scotland.
 Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
 Kufferath, Andreas, Mariaweiler, Germany.
 Tippet, Arthur P. & Co., Montreal, Can.
- Taylor, J. A., Montreal, Can.
 United Wire Works, Ltd., Edinburgh, Scotland.
 Westbye, P. P., Peterboro, Can.
- Waste**
 Hough, R., London, England.
- Wet Machines**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm. Co., Peterboro, Can.
 Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Machinery Co., Sherbrooke, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford Ont.
- Wood Preparing Machinery**
 Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

- Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Basin Electric Light & Power Co., Ltd., Montmagny, Que.
 Beaver Co. Ltd., Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
 Booth, J. R. Ottawa, Ont.
 Bronson Co., Ltd., Ottawa, Ont.
 Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
 Colonial Wood Products Co., Ltd., Thorold, Ont.
 Campbell Lumber Co., Weymouth, N.S.
 Canada Paper Co., Ltd., Montreal, Que.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Compagnie de Pulpe de Dalmas, Dalmas, Que.
 Davy, James, Thorold, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
 Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
 Ford, J. & Co., Port Neuf, Que.
 Jacques-Cartier Pulp & Paper Co., Montreal.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 La Cie de Metabetchouan, St. Andre, Que.
 La Havre Pulp Co., Ltd., Bridgewater, N.S.
 Lake Megantic Pulp Co., Lake Megantic, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 MacLaren Co., Ltd., The James, Buckingham, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
 North Shore Power, Railway & Navigation Co., Clarke City.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
 Ontario Paper Company, Thorold, Ont.
 Oulatchouan Falls Paper Co., Oulatchouan Falls, Que.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Price-Porritt Pulp & Paper Co., Rimouski, Que.
 Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
 River-du-Loup Pulp Co., Ltd., Fraserville, Que.

- Soucy, F. Florentine, Old Lake Road, Que.
 Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 St. George Pulp and Paper Co., St. George, N.B.
 Thorold Pulp Co., Ltd., Thorold, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Union Bag & Paper Co., Cape Madeleine, Que.
 Trent Valley Paper Mills, Glenmiller, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q.

Kraft

- Brompton Pulp & Paper Co., East Angus, Que.
 Dryden Timber and Power Co., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Quebec and St. Maurice Industrial Co., La Tuque, Que.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

- Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

- Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Booth, J. R., Ottawa, Ont.
 Dominion Pulp Co., Ltd., Chatham, N.B.
 Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordan Pulp & Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

- Eddy, The E. B. Co., Ltd., Hull, P. Q.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Ford, J. & Co., Port Neuf.
 Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
 Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

- McArthur, Alex. & Co., Montreal.
 Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

- Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

- See Wood Board and Cardboard Specials.

Bond

- Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."

- Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
 Kineith Paper Co., Ltd., St. Catharines, Ont.
 Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

- Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
 Eddy Co., The E. B., Ltd., Hull, Que.
 Kineith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

- See Wood Board and Cardboard Specials.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Montreal.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co., Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibreloc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hangling

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Miller Bros. Co., Ltd., Glenmiller, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B. Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," Hercules Manilla," "St. Francis Manilla," "Wave Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 6½ King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 73 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 44 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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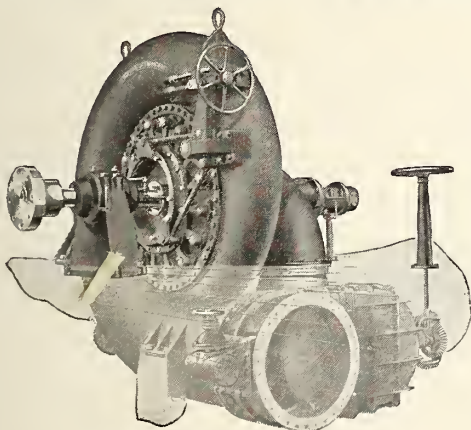
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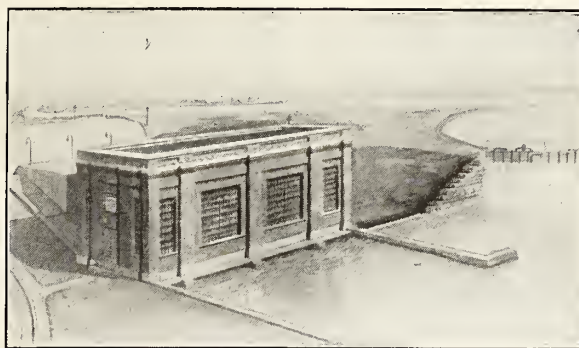
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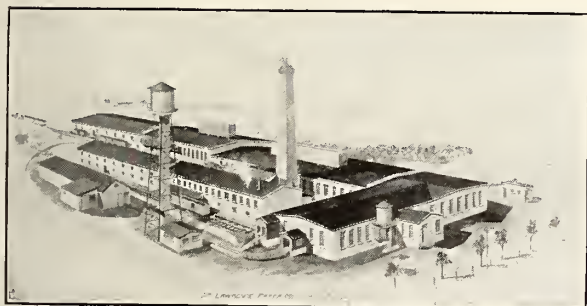
Barber Paper Mill, Georgetown, Ont.



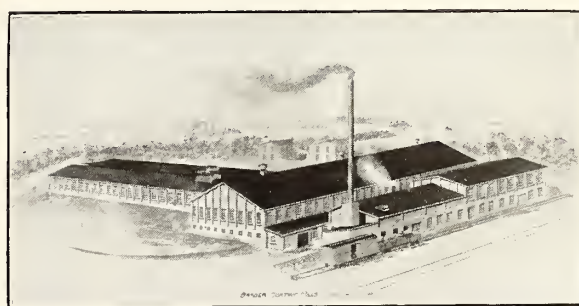
Montrose Paper Mill, Thorold, Ont.



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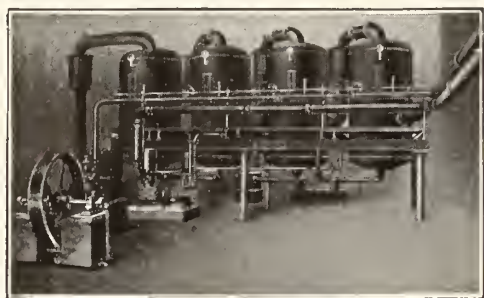
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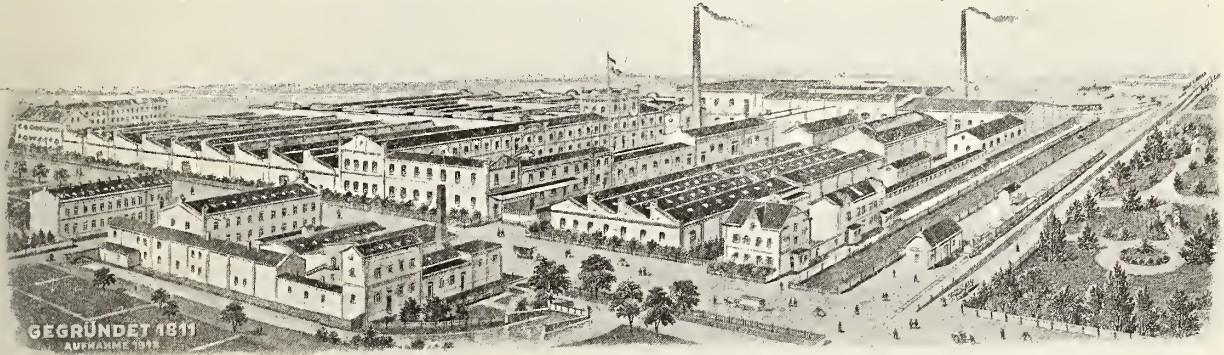
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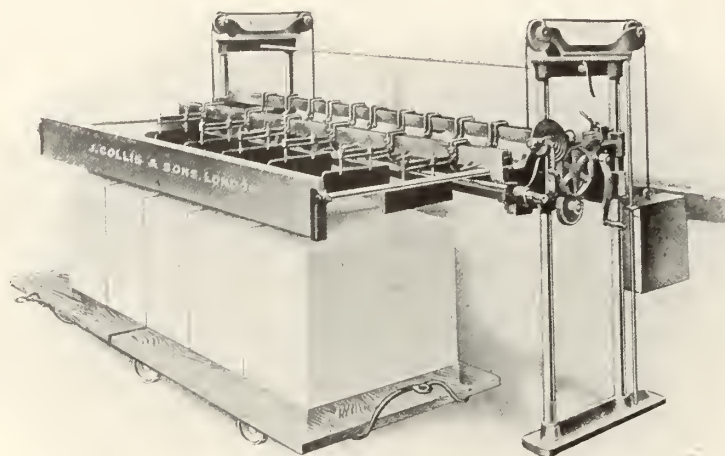
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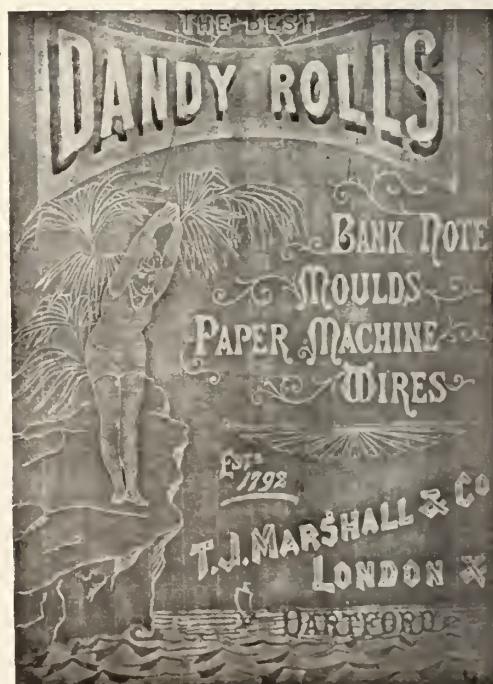
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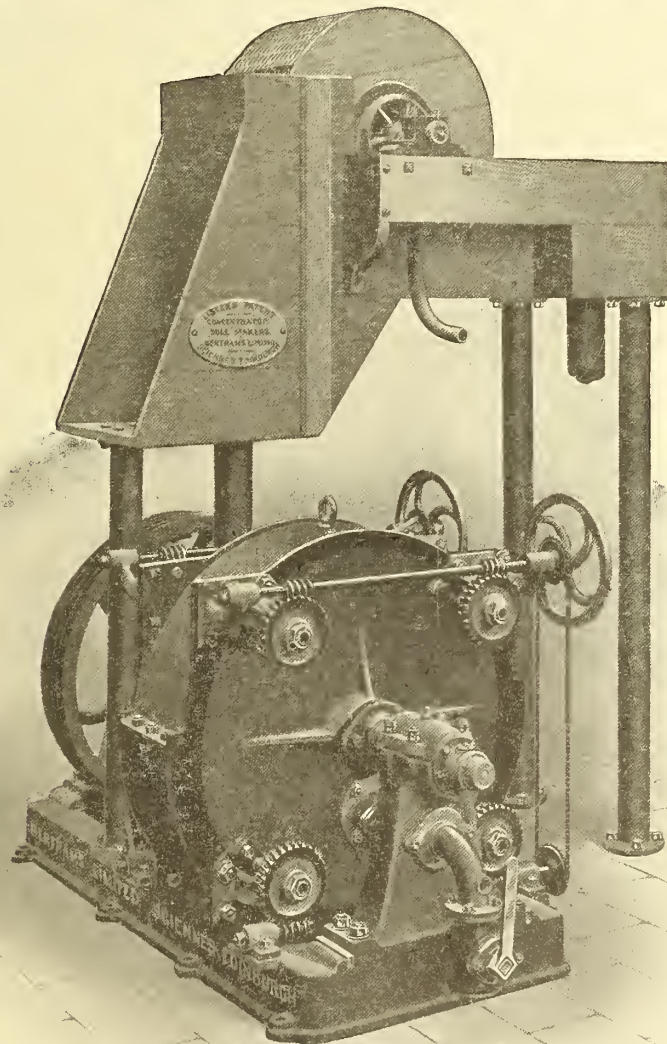
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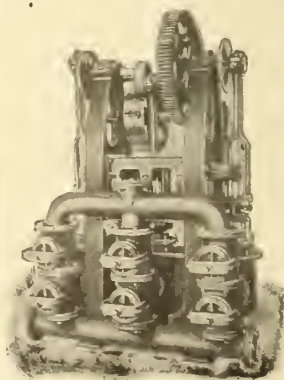
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This regulator gives you a higher and more uniform finished paper with less calendering.

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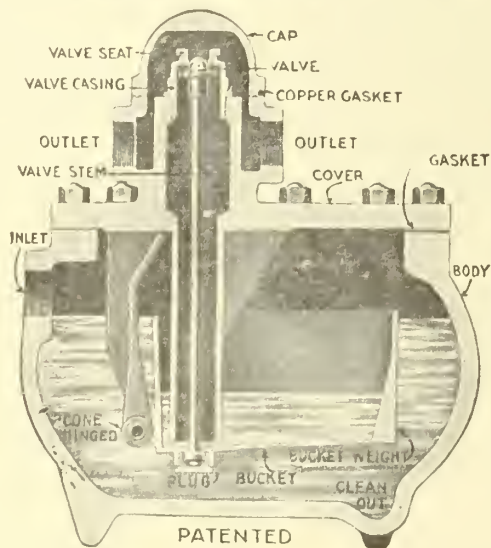
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Machine Co., Limited**
HAMILTON - CANADA

PULP AND PAPER MAGAZINE OF CANADA

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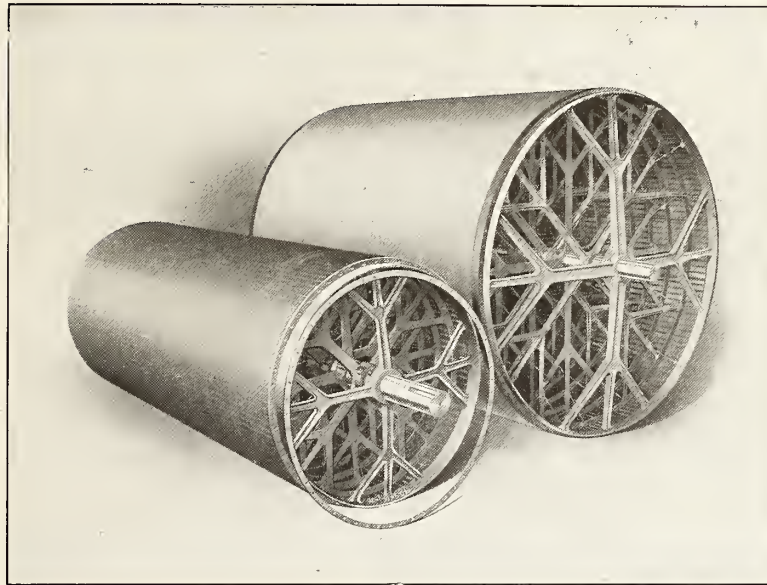
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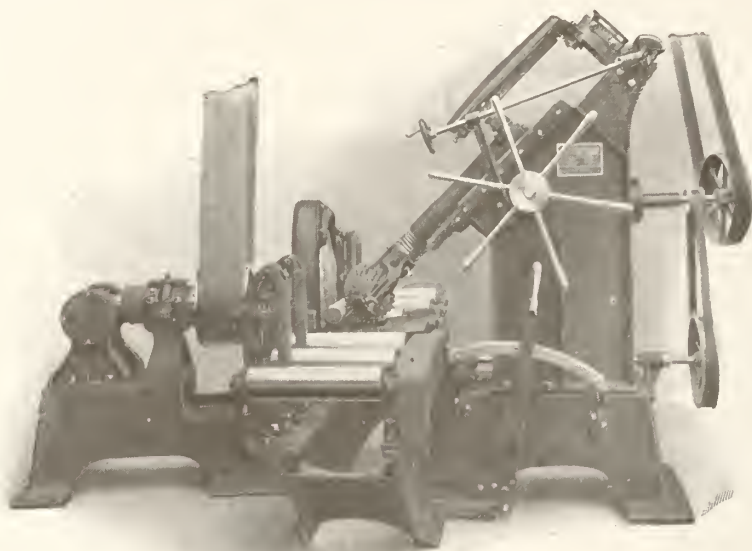
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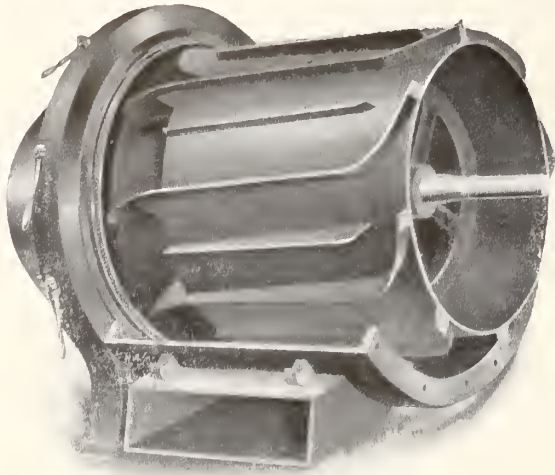
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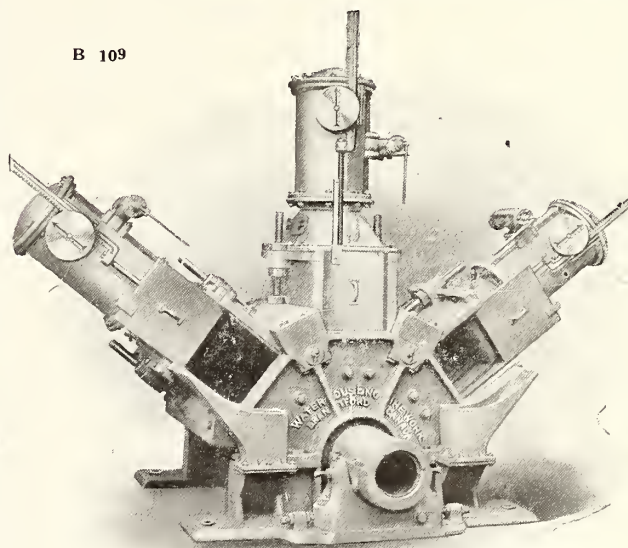
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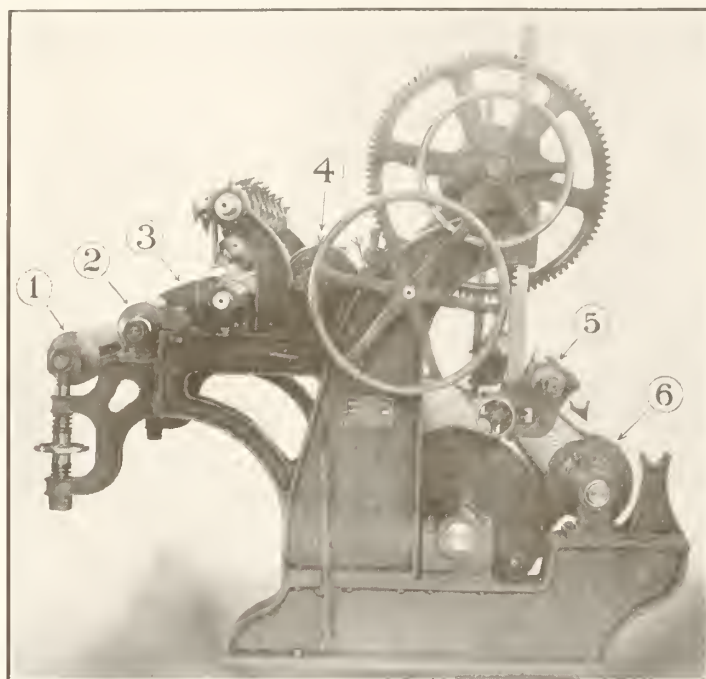
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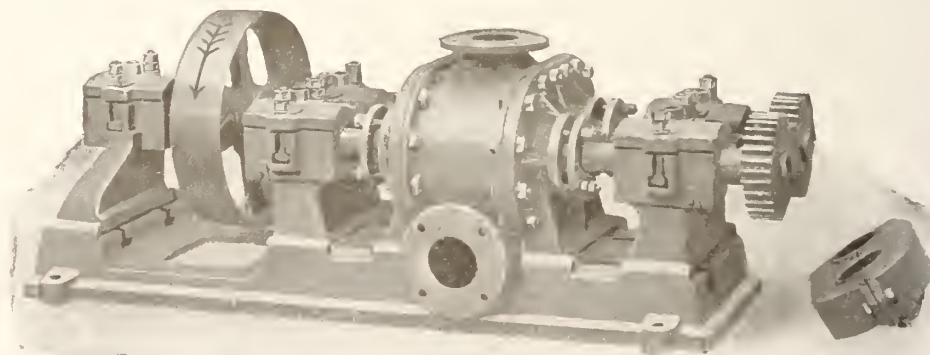
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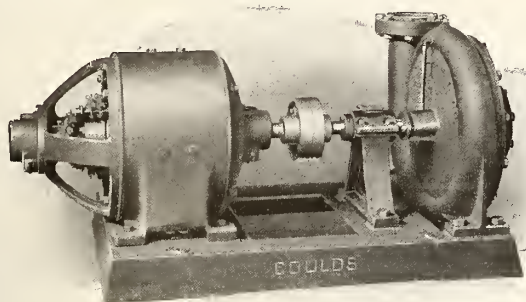
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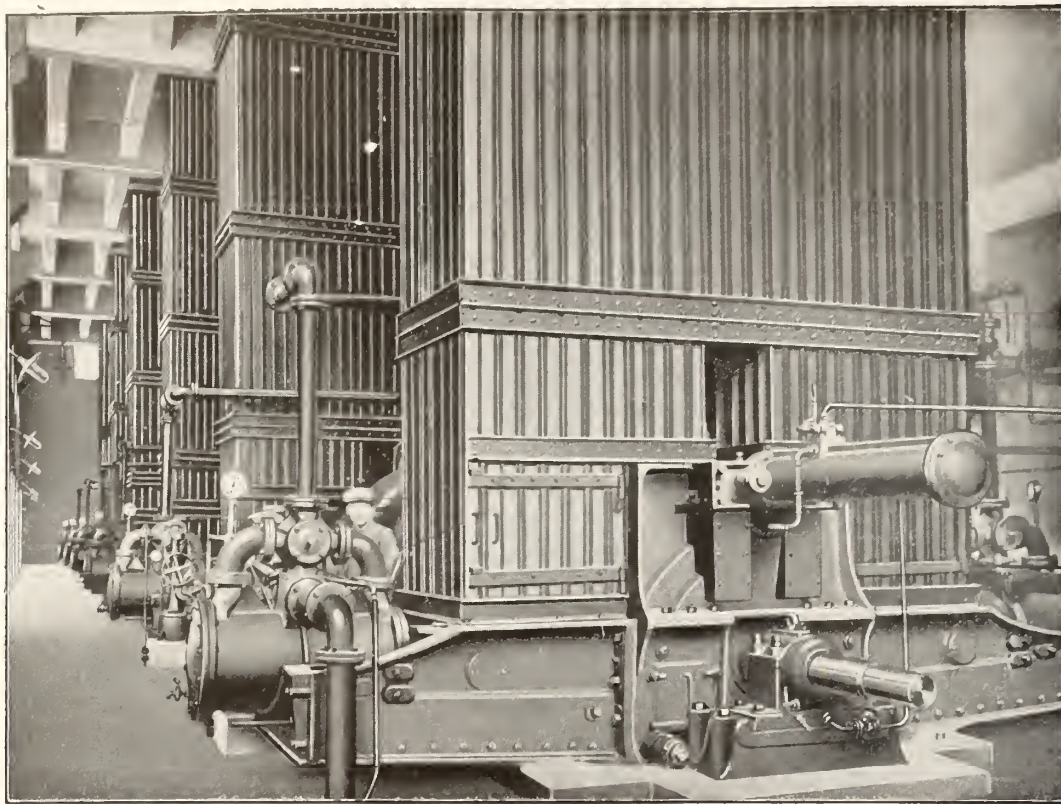
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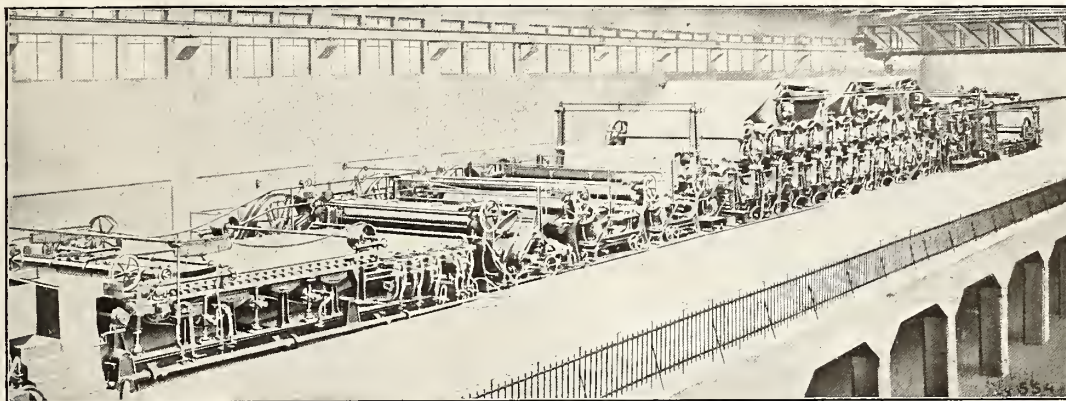
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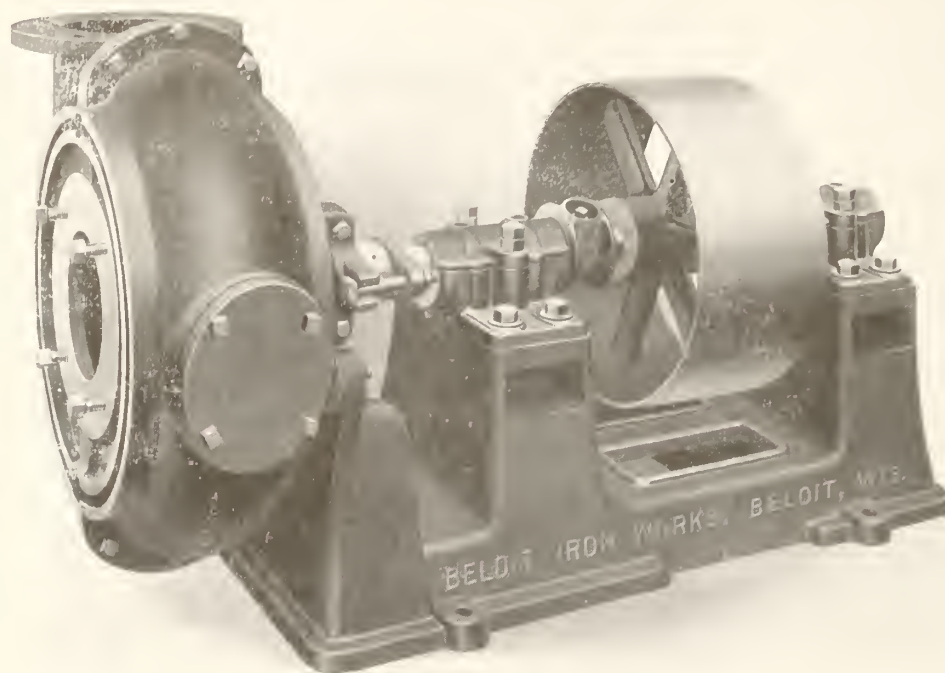
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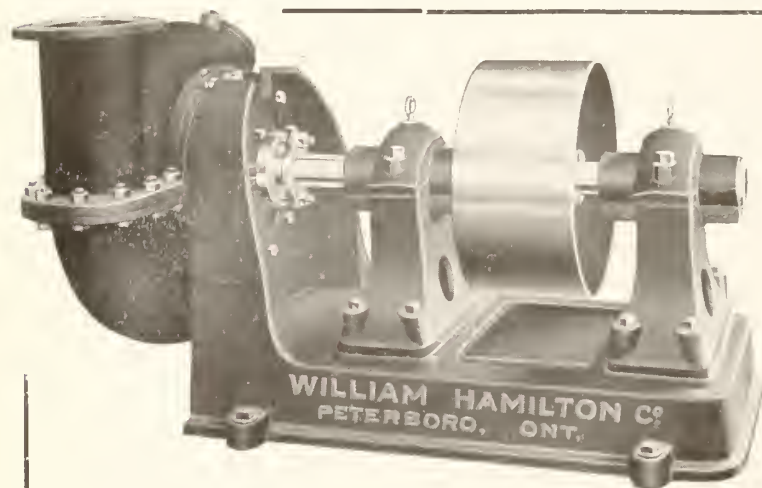
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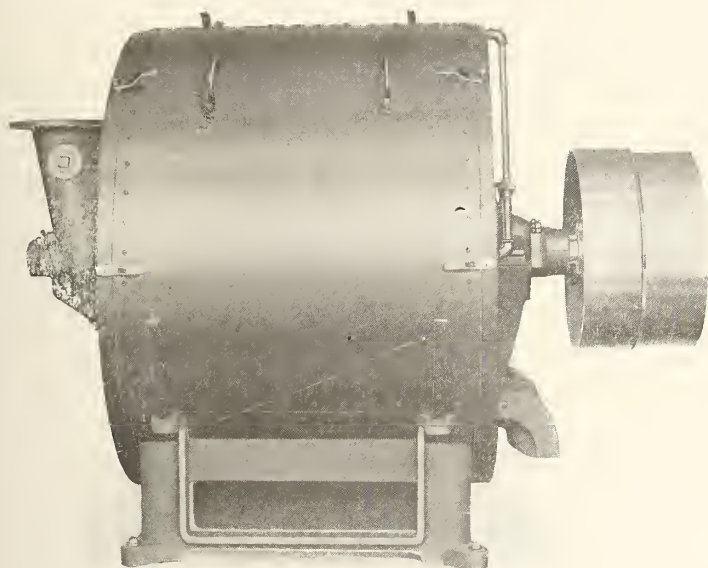
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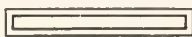
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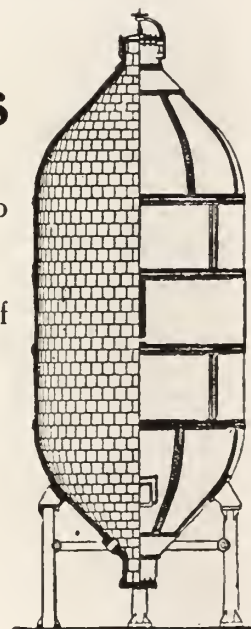
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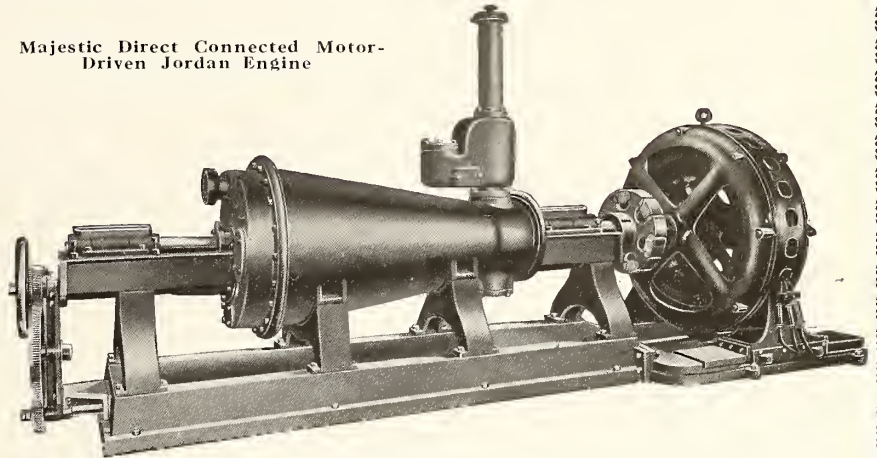


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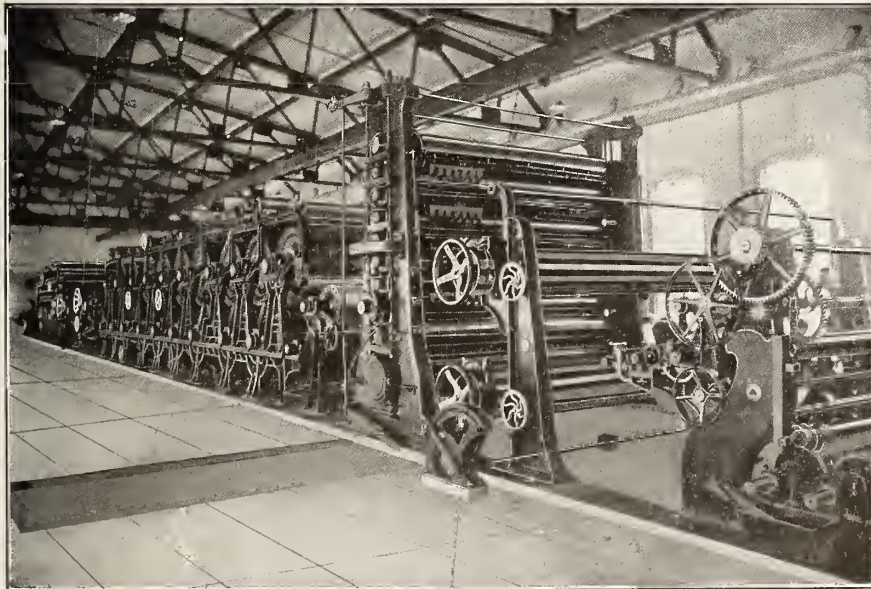
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VOL. XII.

MONTREAL, AUGUST 1, 1914

No. 15

The War Crisis

As we go to press, the world is stirred with a danger whose magnitude can hardly be grasped. The threatened hostilities between Austria and Servia may easily involve Russia, France, Germany and Great Britain and other nations, and every country in the civilized world is taking steps to resort to arms if the need should arise. The war eloud which is hanging over Europe to-day would preeipitate the greatest calamity in the history of Western civilization. Progress would receive a set-back of generations.

Temporarily the pulp and paper industry of Canada would receive a tremendous impetus. The Cuban war sent the newspaper circulation of the United States up 25 per cent, and the South African war caused an increase of 15 per cent in pulp and paper consumption. Already in the present crisis one Toronto newspaper has had noted a jump of 15 per cent.

In the event of great hostilities the large part of pulp export from Europe to America would probably be cut off. This amounts to about 350,000 tons a year. Canada is in no way fitted to undertake to supply such a quantity. It is doubtful if an increase of more than 10 per cent could be brought about. We might, therefore, look for a great rise in prices for our pulp wood and a tremendous tax upon our news mills.

However, it is safe to say that not a manufacturer in the country believes that the industry would be advanced as a whole by the demand. The distorted business conditions which the war would bring about would ultimately work untold damage.

The destruction of the best manhood of the race, the devastation of lands and the uprooting of industry cannot fail to impoverish and impede the world.

Investigation Co-operation

The Forest Products Laboratories of Canada, under the direction of Dr. J. S. Bates, is quietly laying plans for one of the most useful works which has yet been undertaken in the Dominion. As rapidly as possible the various problems peculiar to the wood-producing and wood-consuming industries will be investigated. In general, the plan of studies and research which was reported in the columns of this magazine several months ago will be followed. The work has the warmest support of the Minister of the Interior and the active participation of the Director of Forestry.

The pulp and paper industry is particularly fortunate in having in Dr. Bates a man whose hobby has been beaters, digesters and driers. Further, the appointment a few days ago of Mr. O. F. Bryant, B.S., who has had both theory and practice well instilled in some of the largest mills in the continent, will be received with warm approval.

There is to-day not a branch of the paper business which does not need the untiring investigations of Mr. Bryant and all other earnest seekers for the light. Improvements in the art of paper-making such as are not dreamed of at the present time are due to come sooner or later, but the intricate operations of natural laws are not laid bare without hard work. The practical man, whose experience of many years places him in pre-eminent position in the art should, and doubtless will, find in the Government investigators the most sympathetic, painstaking and enthusiastic of friends and co-workers.

In this connection it is interesting to note two advances which have been made in certain mills in the Dominion. In one, practical tests on the efficiency

of grinders are being carried out by the grinder room superintendent, and in others, complete experimental apparatus consisting beaters, sulphite digesters and laboratory apparatus is to be installed. These are most hopeful indications from which a great impetus to the industry may be expected. Collaboration with the Forest Products Laboratories, when its equipment is installed in September or October, will have a powerfully stimulating effect.

Quality of Wood

An inspection of the pulp-wood stock of several concerns in Eastern Canada reveals wide divergences in the quality of raw material used, and in the extent to which the sticks are barked before being put into the grinder. Some firms bark very closely with the standard rossing machines, the material removed in this way, it is said, running as high as 15 per cent. of the total volume of the stick. The tendency is away from this heavy trimming, however, and, while the rosser will doubtless occupy a distinct place in the production of high grade papers, the increasing demands for ground wood will render necessary the introduction of more barking drums and the passing on to the stones without trimming of a large part of the wood supply.

An experience quoted from a German paper shows what difficulties may be anticipated:

In a paper mill a quantity of printing paper was so flabby and spongy that it was rejected by the customer. The paper-mill made both chemical pulp and also mechanical wood-pulp itself, but had to buy some of both as well. A comparative investigation was made of papers made from bought chemical pulp and bought mechanical wood-pulp, also from the home chemical pulp and foreign mechanical wood-pulp, in addition, from home mechanical wood-pulp and foreign chemical pulp and, finally, such as was made only from home raw materials.

90 per cent mechanical wood-pulp from old, well-seasoned, defective timber resulted in flabby paper, even when 10 per cent hardest sulphite cellulose was added.

90 per cent high-grade mechanical wood-pulp made from fresh healthy timber resulted in a printing paper of good klang even when 10 per cent soft sulphite cellulose was added. If the admixture of soft cellulose was increased to 30 per cent a paper of good klang was still obtained. Only when 40 per cent soft cellulose was added did the paper become flabby.

Soft mechanical wood-pulp made from defective timber cannot produce paper of good klang even when the hardest chemical pulp is employed.

The importance of healthy ground wood is seen from the fact that bad old timber is sorted out from the timber intended for grinding purposes and is used for making chemical pulp or brown wood-pulp.

Canada's best spruce naturally grows in locations with less severe climatic conditions. What is true of

white pine is also true of spruce, i.e., that the farther north you go the poorer you find the trees. As the regions closer to the centres of population, transportation facilities and markets are cut out, poorer grades will be called into requisition. Also, the decrease in the supply of spruce will requisition the use of much Balsam Fir, a tree which is peculiarly subject to fungus attacks. Rotten, shaky and dozey wood will find its way to the grinders in increasing quantities. Having little fibrous length or strength, it will not benefit the pulp. Recourse will have to be had to splitting and cutting, in order to get rid of the punky spots. The injury from decayed wood is a point that deserves the closest attention, for it is undoubted that as time goes on it will be necessary to use poorer qualities of material.

The Love Feast of Competitors

The enthusiastic demand which has greeted a Canadian reprint of an article by Forest Crissey in the Saturday Evening Post shows that his words on "The Love Feast of Competitors" are well founded in the modern business spirit. The article is reproduced in part below.

Service, co-operation and open dealing are the characteristic of business. It is this spirit which dominates the Pulp and Paper Association of Canada. Very rapidly there is being built up a confidence in competitors and a broad desire for co-operation which will place the industry on a footing so stable that business vicissitudes can not seriously affect the fortunes of those concerned.

The instances of benefits from co-operation are numberless, and Mr. Crissey says in his article, the movement is practically in its infancy. The future of the pulp and paper industry in Canada is one of the brightest aspects of the nation's prosperity. Association work will render the advance permanent.

"Only a few years ago it was the fashion for the aggressive manufacturer, who found his competitor was getting the best of him in the guerrilla warfare of rampant personal competition, to send a spy into the enemy's camp to purloin all the trade secrets on which he could lay his hands.

To-day, however, they are not doing this in the best industrial circles. The lively little game of trade spying has passed out of vogue, along with dominoes, pinochle and pussy-wants-a-corner. Instead of sulking in his tent, despatching trade spies and plotting against the industrial life of the other men in his line, after the manner of a chieftain engaged in barbaric warfare, the up-to-date manufacturer is attending the love feast of competitors and putting his fighting energies into a campaign for the good of the line.

In a word, the present-day manufacturer who is a live wire puts in more time attending the meetings of his association than he or his predecessors ever spent in scheming to steal trade secrets from competitors.

Of course there are some survivals of the old school of mutual suspicion who still linger in the land of the Philistines and believe that every man's hand is against them; who continue to talk of the survival of the fittest; and look on all competitors as natural and unalterable enemies.

But these remainders of the old order are not representative of the present hour; they are out of pace with present-day thought and methods and their faces are set towards the past instead of being turned to the future and its cleaner, saner and more constructive methods.

Any man who is strong and broad enough to be a bellwether in his particular business world will unhesitatingly declare that the modern association is the biggest and most significant sign to be found on the face of the whole industrial sky; that the love feast of competitors is the most important function on the business calendar of the down-to-date manufacturer; and that the association movement is an economic uplift that has already accomplished miracles of service to the consumer, the middleman, the manufacturer and seller of raw materials—and this in spite of the fact that the movement is practically in its infancy and has not yet had a chance more than to scratch the surface of the field of its potential usefulness.

Beyond doubt the trade feud is the most common, wasteful and insidious form of industrial warfare. It has ravaged entire industries, and there is scarcely a manufacturing community that has not felt its blighting touch. Hundreds of individual enterprises have been wrecked by it and entire cities have been shut out of a multiplied prosperity because of its wasting and bitter persistence. If the trade association of today could lay no other claim to consideration than its achievements as a smotherer of trade feuds its existence would be amply justified.

No one will deny that the demoralization of any useful industry is an economic waste—a bad thing for the public at large—and that its stability, based on a sure but moderate profit, is the ideal condition for the consumer as well as for those directly or indirectly connected with its activities. Wreckage always means waste, and financial wreckage is no exception to the rule. A few individuals may secure momentary benefit from an industrial failure, but to society at large it invariably involves a final net loss. Labor suffers, investment suffers, and the body of business in general is disordered.

Advocates of the association idea declare that if you would place your finger on an industry that is unstable, precarious, and the prey of bitter and devastating trade feuds you have only to find a line that has no association, that does not know the definition of down-to-date team-work, and that holds to the feudal idea that a competitor is a natural personal enemy. They insist, too, that the product and the business methods of such an industry will be found as debased as its ideals.

Certainly it soon becomes clear to any man who will take the trouble to investigate the situation that the get-together spirit of the typical association of to-day is working an immense change in the personal attitude of men who happen to be thrown in the same line of business activity. To replace devastating in satisfaction over losses inflicted on competitors, personal animosity—which is willing to take its profits instead of in real profits—with mutual understanding, with constructive plans for the good of the line as a whole, is a distinct economic gain.

A manufacturer of malleable-iron specialties had been listening to an account from his seatmate of how a spy had been sent by the owner of a certain factory into the works of his competitor, and had been betrayed by the occurrence of a dramatic accident.

"That's a very moving little tale," retorted the malleable-iron manufacturer; "but the men you tell about are out of date. They're 'way behind the times. They need to put in a rush order for an association missionary and save their spy expenses for association dues and teamwork. Association work is cheap, too, by comparison with spying. I'd hate to think what our line would be without an association. Instead of constantly reaching for one another's throat we're doing something for the good of the line and everybody in it. You can appreciate the spirit of that work without being in it. Let me illustrate this:

"At our last meeting, when the formal business was over we fell to discussing foundry problems. I confessed that there was one which I hadn't mastered, and that it would be worth a lot to me if I could. Then I explained just where my process fell down. One of the shrewdest men in the trade immediately spoke up and said:

"Oh, I've got that trouble beaten—with a trick that is as simple as anything. What you want to do is this"—and then he went into details and explained the whole process. When I returned to my factory I tried it out and it worked to a charm. That one bit of information has been worth a heap to me; and my competitor would never have given it to me if it had not been for the kind of contact brought about by the Association.

"Again, when the manufacturing world in our part of the country was facing a coal famine and I confessed that my supply was desperately short a competitor rose in our meeting and said that he happened to have a surplus he would not need to carry him through, and that he would be glad to send me a few earloads to help me out.

"That's the modern association spirit. You can't beat it. Sneaking trade secrets and trying to throttle the man who happens to be your competitor belong to the Dark Ages of industrial competition—to the period of feudism the association is now driving out of business."

COMMERCIAL EFFICIENCY OF MACHINES

COST OF OPERATION AS COMPARED WITH FIRST COST.

By JOHN W. BRASSINGTON.

(Special to the Pulp and Paper Magazine.)

The most insidious of the engineer's enemies, the one most likely to undermine his reputation and spoil his endeavor, is the ever-present temptation to reduce the first cost of the enterprise for the success of which he is held to be responsible. This wolf in sheep's clothing is often of many countenances; sometimes looking through the lineaments of the financial backers of the undertaking; often appearing in the wiles of the purchasing agent, and again threatening with the fear of a too slim estimate. Strong indeed and of great foresight is the man who stands firm in judgment, and demands that before all things the efficiency of the apparatus installed be considered as paramount and preeminently superior in consequence to first cost.

It is human to Epimethean in effort, it is Godlike to be Promethean, and it is written that the latter is even harder to achieve and even the more unpopular and condemned as it approaches true wisdom. Once the engineer gives way to the temptation to cut the first cost against his better judgment, he begins to sow tares amongst the wheat of satisfactory results. The severity of the punishment meted out to many mill designers and owners, for this lack of judgment in the past has caused the error of injudicious economy in first expenditures to become far less frequent than used to be the cause, but the manufacturing landscape is still dotted with mills suffering from too little boiler power, inefficient engines, rattle-trap machinery, and the thousand and one evils that descend Nemesis like on the plant that is maltreated at its commercial birth.

The difference between a cheap and nasty piece of mechanism, and an efficient and possibly costly substitute is bound to show in operation under the following headings:

(1) Decreased capacity; either the mechanism is too highly rated by the seller or the purchaser has hoped to save in first cost, with the intention of overloading the apparatus.

(2) Shutting down for repairs: this is, of course, a sure result of forcing a machine beyond its capacity.

(3) Upkeep and repairs very expensive and deterioration very rapid.

When the boilers and prime movers of a mill are inadequate to carry the load, the cause is not necessarily chargeable to the boiler plant, though if the boiler capacity is hopelessly inadequate, it is a fault that should be corrected at once; no mill superintendent should neglect to keep a daily record of the boiler load so he can ask with reason and force when necessary for that spare boiler which will enable him to handle his load day in and day out, and at the same time always have one boiler being cleaned and put in first-class condition. As stated above, however, it may not be lack of boiler capacity that is the besetting sin of the power end, because it is sometimes the case that the steam engines that use the steam are cheap and inefficient; an overloaded engine or one that has leaky valves or ill fitting pistons can often use twice the amount of steam that a better designed, a better kept, or a larger engine would require to do the same work.

The writer remembers one plant that came under his personal supervision on which he obtained, after months of fighting, permission to spend fifty thousand dollars (\$50,000), correcting cheap conditions. When the new apparatus was installed and in operation, the fuel bill dropped \$300 a month. The money was spent not in new engines, because we could use all the exhaust steam, but was chiefly spent in correcting piping, feed water heating, pumps and boiler parts. It is nothing unusual to find a power house with its component parts balanced about as follows: for every 100 horsepower of boiler there might be 50 horsepower of grate, 75 horse power of stack, inadequate boiler feed heating apparatus, 25 horsepower of engine, and a load running from a minimum of 10 horse power to a peak of 150 horsepower in 24 hours; all this with the engines eating steam and exhausting to the atmosphere. Often the boilers are burning soft coal on grates designed for anthracite, with long narrow tortuous gas passages to the stack. Such a plant invariably goes what is colloquially called the limit, and on top of conditions of this sort will suffer from lack of proper pipe covering, poor drainage of steam pipes no traps or worse than no traps, overloaded motors, inadequate wiring, shafting out of line, size, etc.

It is a trying experience to listen to the engineer of such a plant, together with the superintendent and the owner, expatiate on the impossibility of locating some power trouble while they look for words of commendation from their listener. Of course, with the prevalence of such troubles, their evident remedy is often as a tale that is told; the moral is accepted and seldom acted upon. It is, however, more often than not that the great majority of the troubles that develop when a plant is operated for a few years are directly chargeable to an effort to cut the first cost by the original designer.

Possibly it is not always the conscious fault of the mill architect and engineer that the output of a paper mill is choked at the outlet by the installation of a cheap or of an inadequate paper machine; one object of this article is to point out some of the salient points of a paper machine that deserves attention and investigation from an intending purchaser before determining on the size and make which he will recommend as the most desirable for the working future of the mill in which he is interested.

The main points of consideration in buying a paper machine are as follows:

(1) "Reputation of similar machines by the same maker for continuity of service." A good measure of this is obtained by stating the output of similar machines in pounds of finished saleable paper per inch of width of wire, per day, as shown by the average production in tons per day for any given period of continuous service. It is quite an interesting study to compare the average productive power of paper machines on this basis. The first cost of a machine averaging say \$500 per inch of width when compared with

another averaging say only \$400 per inch of width, seems large to the prospective purchaser; but suppose the first machine will make say 700 pounds of finished paper per inch of width per day on the average, while the second will only deliver say 600 pounds per inch of width in the same time, as far as can be determined by averaging up known performances. If such be presumably possible, then the first machine would pay back its excess cost per inch of width three times in the first year. These figures are given to illustrate the point of reputation; the application of the principle of research of which they purport to be an example, should be within the ability of a prospective purchaser, armed as he is before purchasing, with the power to make his inquiries very interesting to those who wish to secure his order.

(2) Accessibility of parts tending to shorten the time of putting on new clothing, washing felts, etc. The larger a machine the more important this point becomes, because the period of inaction of the machine during these necessary operations is more prolonged owing to its size, and at the same time, the quantity of output that is lost during these intervals is correspondingly increased. In order to illustrate this point let us assume that the finished product is worth \$40.00, and the stock is worth \$30.00 a ton, giving a loss of \$10.00 for every ton of paper not made. Let us assume that one machine will make almost 50 tons a day or say roughly over two tons an hour, that is, it is nearly 150" wide, making news. For every minute the machine is not in operation, there is a loss of 33 cents, about \$20 an hour. For a 200" wide machine, this amount is correspondingly increased. One hour gained a week in the time consumed in manipulating the clothing of a machine is equal to \$1,000 gained a year, or at 10 per cent. to \$10,000 difference in first cost, that it is well to be willing to pay for the more efficient machine in this respect only.

(3) Percentage of operating time lost due to the breakage of the paper: this is a measure of the efficiency of the design of a machine in a manner so intimate and so innately true that it is surely of great interest to the intending purchaser to find out if possible what difference there may be between the percentages of idle time, expressed as ratios of the greatest possible operating time, for all the makes of machines he may have under consideration. A very few hours of idleness on the part of a machine during the year will not only destroy any saving that may have been affected in the first cost, but it will also skim the cream from the profit of the mill, and send it back to the beaters to absorb more labor.

(4) Cost of upkeep. This includes not only the actual cost of repairs and replacements, the regrinding of rolls, etc., etc., but also the cost of lost output, owing to the enforced loss of product due to a breakdown. The life of a paper machine is, of course, largely, depends on the durability of the design, such durability of design is only obtained by long experience. The ultimate value of a paper machine to its owner is more dependent on its life, its continuity of action, and its independence of repairs than upon its first cost.

(5) As a paper machine depends on its capacity, or rather its ability to produce a large quantity of paper per unit of time in order to show an adequate return for the money invested in it, and as it is really the ultimate crowning essential element in the commercial success of all the operations that lead up to it, it is of prime importance that first cost be given a distinctly secondary place in comparing two paper machines with

the intention of selecting one. On the Fourdrinier part, the comparative areas of the two forming tables should be contrasted, and the number of feet of roller contact per foot per minute should be noted. The design of the bearings of the suction boxes, of the capacity for change of elevation, all are far better worth considering than the dollars and cents view. When it is remembered that a difference in price of \$25,000.00 at 10 per cent. interest is \$2,500.00, which means the amount lost at \$10.00 a ton, by a shut down of five days, of a machine 150 in. wide, or of three and three-quarter days of a machine 200 in. wide, or to illustrate in another fashion a difference of twenty-five thousand dollars saved in first price by buying a cheaper machine may result, if the cheaper machine is not as good (if it loses by breaks, by changing clothing, by washing up, or by late starting, only a little over 1 per cent. of its operating time, if a 200 in. machine, or a little over 1½ p.e. if a 150 in. machine) in the loss of not only the interest at 10 per cent. of the money saved on the first cost, but also in cutting profits on a larger amount invested in the rest of the mill. It is evidently a serious matter to handicap the main controller of the output by injudicious attention to first cost.

(6) A matter of importance in considering the first cost of a paper machine as compared with its value as a profit maker is the consumption of clothing by the machine. Wires are expensive, and if the design of stretcher, the squareness of the fourdrinier as a whole, and the comparatively small power required to drive it, tend in any one design to prolong the life of the wire, it is surely worth while to take this into consideration. A glance at the angle the wire makes over the stretcher roll will soon inform the observer as to which design of fourdrinier is superior in this respect; the larger this angle the more severe the stretch of the wire for the same force on the stretch roll and sometimes the front tender is a pretty husky fellow. The wire drives all the rolls except the lower couch, and if these rolls turn hard or unevenly the wire is to that greater extent strained. The smaller the number of wire rolls the better as long as their necessary service is fulfilled.

The design of the stretcher in that part of it that gives the machine tender the power to unduly stretch the felts in the press part is worthy of attention. A long felt with the minimum number of rolls, the design of the bearings, the accessibility of the parts; all these things are more important than first cost. When a paper machine does well, the owner rapidly forgets the first cost, and at the same time remembers his designing engineer with pleasure; if the paper machine gives trouble and is not making good, then the first cost is again forgotten but the designing engineer who is responsible for the installation of an inefficient machine, is remembered as something noxious that should be avoided. The engineer is never praised for what is successful in his work, though he is given more like it to do; while one failure on his part will destroy in a day reputation that has been years in the building.

The question of first cost as compared with cost in operation is of very small moment whether the mechanism purchased is a boiler, an engine, a pump, a jordan or whatever machine it may be; and this fact is becoming recognized more and more every day by those interested in manufacturing establishments; it is, however, indisputable that the Paper Machine is without a rival commercially in its economic independence of first cost and its absolute dependence on successful operation; this is due to the great quantity and vol-

time of the output it controls, an output so large and valuable that all other machines may seem insignificant as compared with it. For every dollar invested wisely in a paper machine there is probably a larger return than can be obtained from any other single mechanism, while on the other hand, there is probably a larger proportion of loss, should the purchaser's money be unwisely invested in a paper machine that is cheap in money and design, than might result from any other investment.

Yet it is possible to paralyze the capacity of a first-class paper machine if it is cheaply installed, and saving in first cost is made a primary object in its immediate surroundings. It is quite possible to cut down the output of a paper machine by placing it in a cheap building where the floor beams, though strong enough, are limber and springy; where the supporting columns are designed only heavy enough for first-class warehouse practice and not rigid enough to resist the vibrations that come with machinery in motion. It is perfectly easy to make a marked reduction in the output of a paper machine, and a correspondingly large increase in the order for "broke" for the beaters, if the dryers are provided with a cheap ventilating system if a saving in first cost prevents an adequate supply of dry air, and the prompt removal of the saturated air that rises from the dryer nest as it licks up the moisture from the moving paper; five hundred cubic feet of air per pound of paper is the minimum figure that should be considered as the proper amount to supply and to remove from the environment of the dryers; twice this amount would probably be better. It is a simple matter to spoil the efficiency of a paper machine in a fine firm building, with a magnificent ventilating system serving the dryers, if the prime mover is too small for its work; an engine may be ample to drive a paper machine at a certain speed when first installed, but if often happens that a smooth running paper machine seems to urge its owner to speed it up; it seems to say "another 25 feet per minute will not hurt"; when this time comes and the engine is only just big enough and fast enough, and is indeed going its limit at the first maximum paper speed determined on, then the saving in first cost of that engine means a loss of opportunity for increased earnings.

So it seems to be well in installing the machinery in a paper mill, to insist on a rigid building first and foremost; when this is secured to determine the maximum size and number of boilers required and then add another one, in the same way go through the whole mill from wood pile to shipping room, and allow for growth. If this is done and done with courage and audacity, some day the owners of that mill will speak highly and well of its designer. First cost is only a matter of a short time though often, to use a slang expression of a "hot time"; but output is always a matter of the now, the present; so it is wise to reach "a thought" through "time" to catch the "far off interest" of praise.

Benjamin Krebs, formerly of East Pepperell, Mass., has been appointed superintendent of the book and writing mill of the Canada Paper Co., at Windsor Mills, Que., and has entered upon his duties. He succeeds Robert Aitken, who resigned some time ago, after twenty-four years' service with the company. Mr. Krebs comes highly recommended as a capable and thoroughly experienced paper maker, having been employed in some of the leading plants across the border.

TO BUILD UP AMERICAN EXPORT TRADE.

For the purpose of co-ordinating the foreign trade activities of the nation in an aggressive and systematic extension of American oversea commerce, Alba B. Johnson, president of the National Foreign Trade Convention, held at Washington, May 27 and 28, has announced the personnel of the Foreign Trade Council, created by resolution of the several hundred delegates from all parts of the United States who attended that conference. James A. Farrell, president of the United States Steel Corporation, is named as the chairman, and all sections of the country, and practically all branches of industry, commerce, transportation and finance are represented among the members.

Outlining the purpose of the council, Mr. Farrell said:

"The next great era in the economic development of the United States will be the extension of our foreign trade, and the formation of the Foreign Trade Council is a necessary preparation for this evolution in our business life. By gathering active and representative business men into such a body and co-operating with all elements in our oversea commerce it is hoped to encourage every practical and sound policy designed to secure for us our share of the trade of the world's markets. The foreign trade of the United States is now valued at four-and-a-half billion dollars a year, of which two-and-a-half billion dollars represent exports. This trade has developed largely by reason of our natural resources and the individual enterprise of American industry, but without an American merchant marine, comprehensive national policy or commercial and industrial co-operation. The foreign trade is important as affecting American industrial enterprise and labor at home. On the other hand, it is not large enough to absorb all our manufacturing potentialities."

The National Foreign Trade Convention at Washington, which was attended by 341 delegates, representing seventy-two manufacturers' associations, chambers of commerce and other commercial and industrial organizations, showed that American manufacturers, merchants, railroad and shipping interests earnestly desire a more systematic development of the foreign trade, through creation of a merchant marine, establishment of American banks abroad and governmental co-operation in foreign trade. The convention unanimously adopted a resolution declaring that "the development of the United States makes it essential to the best interests of the nation that the Government and industrial, commercial, transportation and financial interests should co-operate in an endeavor to extend our foreign trade." This will be the purpose of the National Foreign Trade Council. Greater prosperity through greater foreign trade is the basic principle of the movement.

Robert H. Patchin, formerly Washington correspondent of the New York Herald, has been appointed secretary of the council, with temporary offices at 71 Broadway, New York.

CONSUMPTION OF A PULP MILL.

According to a calculation published by the "Papier Zeitung" a pulp plant requires two cords of wood to the ton of pulp, as well as an aggregate of one-half ton of sulphur, coal and lime to the ton of manufactured product. The consumption of horse power per ton of pulp is estimated at 6 to 10 h.p. in 24 hours.

The Influence of the Addition of Hedychium Pulp to Chemical and Mechanical Wood Pulps Upon the Physical Qualities of Paper Produced Therefrom

By CLAYTON BEADLE and HENRY P. STEVENS.

Hitherto, in the various published investigations on the subject of Hedychium coronarium, the results recorded have to do with papers of various kinds, qualities, and substances made the fibre alone or, in some few instances, with the addition of clay. No results have been published with a view to ascertaining the effects of using Hedychium coronarium in admixture with other papermaking fibres. In a paper mill where a commercial trial was made of Hedychium coronarium paper of the strong Manila quality, it was decided, subsequent to the production of the Manila paper, to mix some of the beaten Hedychium coronarium pulp with long-fibre sulphite pulp. This gave rise to a very strong paper possessing qualities somewhere intermediate between those of strong sulphite and strong Manila. As Hedychium has the property of self-sizing pulp, we thought it would be as well to ascertain whether it imparts these self-sizing qualities to other fibres when used in admixture with them. Also, whether, on the addition of considerable quantities of clay, the paper still retained its sizing qualities.

Certain physical qualities of clay loaded Hedychium papers have recently been dealt with ("The Effects of Mineral Loading upon the Physical Qualities of 'Hedychium' Paper," Journ. Soc. Dyers and Colourists, March, 1914, xxx., No. 3), at considerable length. Clay loaded Hedychium papers of the percentage compositions given in Table A were examined to ascertain how far they remained inkproof. It is well known that all ordinary fibres, in order to render them inkproof, have to be sized with rosin (or gelatin), and that the addition of clay calls for an increased consumption of rosin in proportion to the amount of clay retained, that is if the loaded papers are to retain as great an inkproof quality as that of the unloaded.

Table A.

No.	Date.	Hedychium.	Clay.
1.	December 16, 1913....	100.0	0.0
2.	"	 91.5	8.5
3.	"	 85.0	15.0
4.	"	 82.7	17.3
5.	"	 73.2	26.8
6.	"	 68.6	31.2
7.	"	 57.7	42.3

No. 1, consisting of Hedychium and containing no loading, behaves towards ink very much like a strong Manila paper, that is, a broad ink mark showed the liability of repelling the ink on the surface somewhat. The same liability is to be noticed with some very hard tub sized papers. This is a general indication of hard sizing.

No. 2, which contains 8.5 per cent. of clay, behaves very similarly, but repels the ink on surface in a somewhat less degree.

No. 3 also, although in the case of 3 the ink spreads in a more normal fashion.

All these are very resistant to ink penetration.

No. 4, containing 17 per cent. of clay, shows great resistance of penetration of ink, but the ink spreads on the surface in a uniform manner more like that of a

normal paper, and the same may be said of Nos. 5 and 6.

No. 7, which contains 42 per cent. of loading, which is an exceedingly high percentage, and with ordinary paper stock would require a large amount of rosin in order to render it properly inkproof, does not show the least penetration to the other side for ordinary substances, and, when Stephens' blue-black ink is used, which we use as a standard, shows practically uniform spreading on the surface and no appearance whatever of penetration to the other side for normal thickness.

Table B.

Composition.		Bursting strain in lbs. per square inch.	
Hedychium.	Mechanical A or chemical B.	A.	B.
Per cent.	Per cent.		
100	0	64.5	58.3
90	10	65.0	67.0
80	20	63.0	63.0
70	30	65.0	60.3
60	40	60.1	68.3
50	50	55.0	70.0
40	60	50.0	66.1
30	70	44.0	61.6
20	80	38.6	58.1
10	90	31.0	61.4
—	100	29.0	54.6

These results, therefore, show that the influence of the parenchyma cells of the Hedychium is so great as to enable papers to be loaded with clay up to the extent of 40 per cent. without breaking down the self-sizing qualities. This is in itself a valuable property. It must not furthermore be lost sight of that with most paper-making fibres it would be practically impossible to retain such a large percentage of clay, even with the aid of rosin sizing.

Mixtures of Hedychium pulp and mechanical wood pulp were made of compositions as per Table B. Similar mixtures were made of Hedychium pulp and chemical wood pulp. Papers were made from each of them and carefully tested by ink tests. Papers prepared from the Hedychium mechanical mixtures were also tested by ink tests. Down to mixtures containing 60 per cent. Hedychium and 40 per cent. mechanical wood, there was no appearance whatever of penetration or spreading upon the surface. In fact such mixtures appear to behave, as regards ink bearing and ink spreading, in the same manner as 100 per cent. Hedychium. At 50 per cent. Hedychium and 50 per cent. mechanical wood there is a slight disposition to spreading laterally, i. e., at right angles to the ink mark, in feathers upon the surface but with practically no penetration. At 40 per cent. Hedychium and 60 per cent. mechanical wood the feathery spread on the surface is augmented. At 30 per cent. Hedychium and 70 per cent. mechanical wood the ink penetration to the other surface is distinctly marked, and both the feathering and the penetration increase with increased quantities of mechanical; thus 80 per cent. mechanical more so

than 70, and 90 per cent. more so than 80 per cent., and, of course, 100 per cent. mechanical is quite soft and liable to immediate penetration.

Taking the case of Hedychium-chemical wood pulp mixtures when tested in a similar manner to the above show very surprising results. All of them show no spreading and no penetration. The breaking down in ink bearing qualities is between the paper showing 10 per cent. Hedychium and 90 per cent. chemical wood, and the 100 per cent. chemical wood paper.

It is evident, therefore, that not only has Hedychium when in admixture with clay, mechanical and chemical wood, marked strength-giving and such like qualities, but it acts as a sizing agent as well as a mineral retainer, and the proportion necessary to produce self-sizing will depend not only upon the proportions (percentage compositions) of Hedychium with these other substances, but upon the nature of the substances with which it is mixed. Thus with chemical wood-pulp, a small amount of Hedychium only, such as 10 per cent., is sufficient to produce self-sizing; with mechanical it is at least 50 per cent., and perhaps somewhere about the same proportion with clay.

Table B is also intended to show the influence of admixture of Hedychium with (a) mechanical or (b) chemical wood pulp upon the bursting strain of the papers produced. The first two columns indicate the compositions, the third column relates to (a) mechanical, and the fourth to (b) chemical. The bursting strain is expressed in lbs. per square inch and, for purposes of comparison, is reduced to a standard substance. Each result given in the table is a mean of ten tests. Attempts are always made in such trials to arrive at a uniform substance so as to avoid any further calculations, but where they differ from uniform substances they are calculated to a uniform substance.

Tests were also made (not given in table) of the breaking length of these papers. The results as regards breaking length do not indicate anything particularly striking.

Hedychium for these purposes is beaten fairly short in order to make it operate more as an agglutinating agent than as a fibrous material, and, in each case of, that used in admixture with chemical wood, it was so beaten that the bursting strain of 100 per cent. Hedychium was made to correspond as nearly as possible with the bursting strain of 100 per cent. chemical. Taking the case of the bursting strain of the Hedychium-mechanical mixtures, it will be noticed that the 100 per cent. Hedychium has more than doubled the bursting strain of the 100 per cent. mechanical. From the results of the top members of the series, there is no evidence of diminution in the bursting strain until the composition arrives at somewhere between 70 per cent. and 60 per cent. Hedychium and 30 per cent. to 40 per cent. mechanical. After this point as the percentage of mechanical increases so the bursting strain diminishes.

Hedychium is a pulp which stands the admixture of a certain proportion of other material much inferior to itself without showing deterioration, at least so far as bursting strain is concerned. This is borne out in the Hedychium-mechanical mixtures; it has been observed in cases of admixture with clay, and it is also borne out when one comes to look at the figures obtained with admixtures of Hedychium and chemical wood pulp in which the unmixed chemical wood is only slightly inferior to the unmixed Hedychium. Here it

will be observed that, from 100 per cent. Hedychium up to 50 per cent. Hedychium and 50 per cent. chemical, there is a distinct rise in bursting strain, 100 per cent. Hedychium being 58 and the 50 per cent. being 70, after which there is a distinct fall. We can only account for these results by assuming that there is in the normal Hedychium pulp a surplus of parenchyma cells, that is, more than is required for giving to the Hedychium fibres proper their necessary strength and self-sizing qualities, so that on the addition thereto of any foreign fibre a mixture may be obtained which possesses greater strength or greater bursting strain than the strength-giving constituent, namely, the Hedychium. This is a distinctly valuable property, especially in cases where it is desired to blend Hedychium with other paper-making fibres. Not only is this property to be noted so far as the bursting strain is concerned, but also the breaking length. Thus the mean breaking length of the unmixed Hedychium and chemical, that is, when each unmixed paper is tested and the mean taken for both, is 4.5 kilometres. One would assume in the ordinary course of events that all mixtures of the two would fall somewhere between the figure obtained for the unmixed Hedychium and that obtained for the unmixed mechanical. As a matter of fact, the unmixed Hedychium shows 4.0 kilometres breaking strain, and that containing 80 per cent. Hedychium and 20 per cent. chemical is 6.0 kilometres. Therefore much stronger paper is obtained by mixing the two than from either of the constituents separately. We wish, however, to point out that far stronger papers are obtainable alone than any of those recorded above when the material is suitably beaten for the purpose, i. e., when Hedychium is beaten for long and hairy papers or kraits. Thus the greatest strength so far obtained is somewhere between 10 and 11 kilometres. The Hedychium pulp here used is prepared in such a way as to act as an agglutinating, compacting, and self-sizing agent, and as a mineral retainer. At the same time in some respects it possesses qualities which are quite equal to those of the strong kraits. When, however, the Hedychium and chemical pulps are blended with large proportions of chemical, as, say, equal weights of each, although the bursting strain is very high, the breaking length found is almost exactly that calculated, the observed being 4.77 kilometres and the calculated 4.5 kilometres.

When a fibre is investigated for the first time it is desirable to examine the qualities of paper producible from it without admixture with other fibres, but inasmuch as the qualities of mixture cannot be inferred and the paper maker works mostly with blended fibres, it is important as a further step to test the qualities of various mixtures. This communication is for the purpose of recording the influence of such mixtures.

R. H. CAMPBELL IS HONORED.

Toronto, Ont., July 20.—R. H. Campbell, Superintendent of Forestry for the Dominion, was signally honored by being made an honorary member of the Royal Scottish Arboriculture Society, which honor was conferred upon him at the diamond jubilee conference of the society at Edinburgh. Mr. Campbell in replying, referred to the keen interest which the Canadian Government had displayed in regard to forestry work throughout the Dominion.

Saw Mill Refuse and the Pulp and Paper Industry

By G. B. STEFFANSON.

(Written Specially for Pulp & Paper Magazine.)

Many a saw mill owner regrets that he has to stand the cost of conveying wood refuse, which cannot by any means be disposed of for the raising of necessary power for the saw mill, to a place where it can conveniently be burnt or otherwise destroyed.

He, however seldom realizes that the refuse has a commercial value as fuel for steam raising, if his saw mill is located in a reasonable distance, from a place or places where power is used and cheap water power or a local natural resource of fuel is not available.

Hundreds of power plants throughout the Dominion use imported coal for fuel, though in the vicinity an abundance of wood waste is destroyed.

mills do not belong to the same concern, it usually so happens that the saw mill goes on destroying its wood refuse, and the pulp and paper mill buys imported and expensive coal for fuel.

THE VALUE OF SAW MILL REFUSE AS A FUEL FOR STEAM RAISING IS NOT FULLY REALIZED AMONGST PULP AND PAPER MANUFACTURERS.

One of the main reasons for this is, that only in recent years, ovens have been designed, which in an economical way utilize even low grade saw mill refuse, without being too expensive in first cost and in up-keep.

Ovens have been designed along many different lines, gas generating, stoker arrangements for direct firing under the boiler, and so on, and more or less fancy designs of Dutch ovens have been tried.

The best oven as yet designed for the utilization of this kind of fuel is undoubtedly the Half-Gas Furnace.

This furnace or oven is not very cheap in first cost, and it takes some experience even for a bricklayer, competent on fire brick work, to build it.

This is undoubtedly one of the main reasons why this kind of oven has not quickly found its way throughout the parts of the world where saw mill refuse is available.

Ovens of this kind will be burned out in two or three months if built by an incompetent brick layer, and of inferior material, whereas an oven built right and of the right kind of material and properly looked after, should stand for eighteen months to two years, going night and day.

Only high grade fine-grained fire brick, true in angle and with sharp corners should be used, and for the arches bricks of the right shape are most essential.

The bricks should before setting be ground well together, in order to get a tight fit. A thin mortar of equal parts of unburnt fire clay, and burnt crushed fire brick or quartz sand all well sifted, should be used. An even, thin layer of the mortar should be evenly spread over the joint surface of the brick, and this worked down in its place as close as possible to get the smallest possible joints. This is a very essential thing, as the temperature is very high, especially in the upper part of a half-gas oven and the heat eats out a wide joint much quicker than it burns good fire brick, thus exposing two sides of the brick to the fire.

Fig. 1 shows a longitudinal cut elevation of a half gas oven, attached to a Lancashire boiler of 1,000 sq. ft., heating surface (100 H.P.) Fig. 2 shows a cross-cut elevation at the feed holes, and Fig. 3 shows a cross-cut elevation in the middle of the oven. Mark the difference between the width of the fuel room and the width of the grates. (Figs. 2 and 3.)

The fuel is admitted through the two feed holes (a). These holes should be well covered over by fuel or by lids, in order not to admit an excess of air this way. The grates are built as ordinary coal grates or as step or extension grates, this latter especially where sawdust is burnt as well, and in order not to allow any of the fuel to escape to the ash pit unburnt.

The grates should be kept well covered with fuel in the lower part of the oven and to accomplish this the

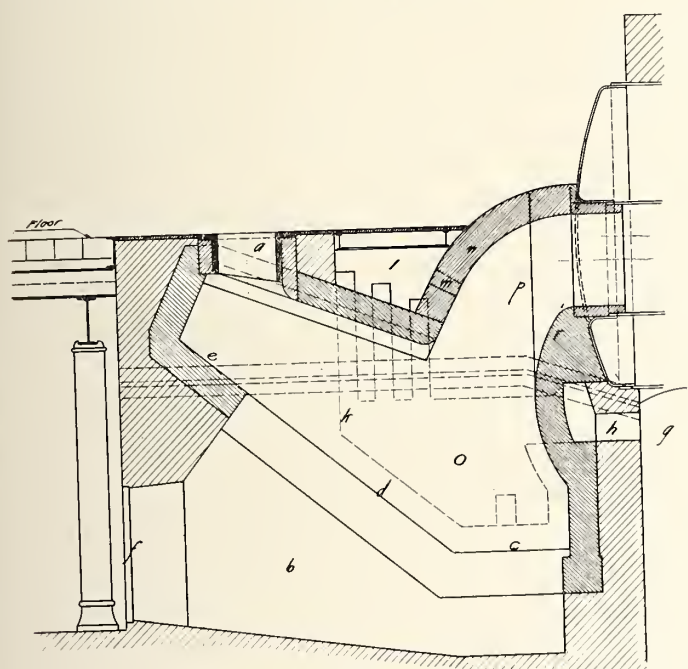


Fig 1

The average saw mill refuse has not a large value as fuel, if weight and bulk are taken into consideration, if rightly handled it can, however, be shipped both by water and by rail for a considerable distance to the advantage of the seller as well as of the consumer.

Here the Railway Commissioners as well as the railway companies could help the industry in general by granting low local rates, this would soon add to the tonnage, and even if not giving a direct income, would bring down the railroad's local tonnage cost, and thus give an indirect income to the railway companies. Suitable ears would, however, have to be provided.

The sawdust is usually more than sufficient for the raising of the power, necessary in the sawmill using ordinary Dutch ovens. By using more efficient ovens much more than the necessary power could be raised for sale or some of the sawdust could be sold to other steam raisers.

Pulp and paper mills are, as a rule, located near saw mills, as they both have the same source for the supply of their main raw material; still, if the two

upper part should at all times be kept full of fuel. The horizontal ash grate (c) is especially liable to lay bare, if the fuel is not poked down from time to time. The inclination of the grates could be made larger, in order to have the fuel to fall down and cover this horizontal grate without any extra work, this, however, makes it more difficult to remove the ashes from this grate, where they mostly collect. This ash grate should preferably be of the swivel type and so arranged that it can be operated from outside the oven.

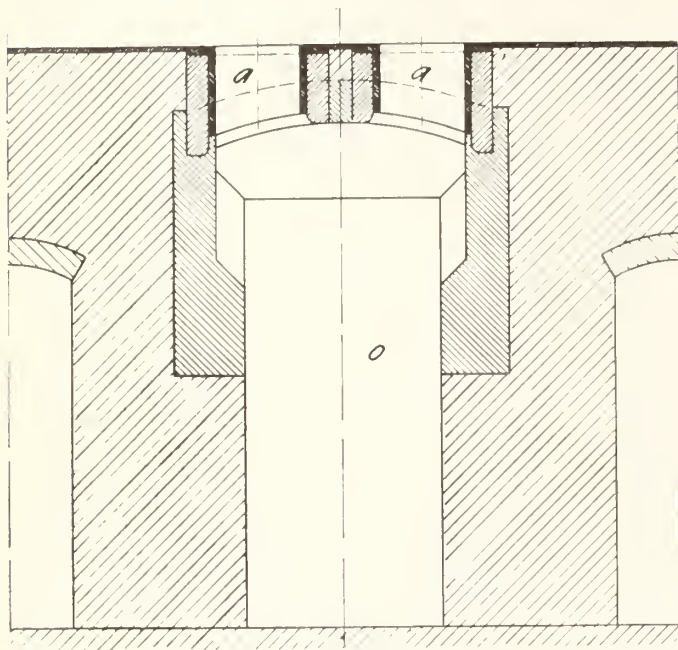


Fig II

The prolongation (e) of the grates serves to receive the fuel and by this arrangement a considerable quantity of fuel not on fire, will prevent an excess of air from entering the furnace, even if the lid is off.

The ash pit door (f) is provided with small dampers regulated from the main floor, and large enough to admit sufficient air for a partial combustion, or rather for the forming of combustible gases.

A canal (g) is provided for behind the furnace and under the front part of the boiler to accommodate blow-out pipes. From this large canal two secondary air canals (h) one on each side of the furnace, lead to the both canals (k), from these to the room (l) above the furnace chamber and through the holes (m) in the arch (n). The air is heated when passing the canals (k) and in the room (l).

The combustible gases from the furnace (o) pass up through the canal (p) where they are thoroughly mixed with the hot secondary air coming through the holes (m). Complete combustion therefore takes place just before the gases enter the fire tubes, thus giving most of its initial heat to the front part of the fire tubes, not to the brick work outside, nor to the inner end of the fire tube, which latter means a considerable lowering of the capacity of the boiler.

When lining the furnace with fire brick binders extending from this into the brick work behind, should be provided for at canals (k). This in order to prevent the fire brick lining to fall out when it is burnt thin. It may take only a few weeks to burn out half of the thickness of the lining, but the nearer the fire gets to the cooled outer side of the lining, the longer time will take it to burn the lining away, and a thin film of lining

may resist the action of fire for many months if it is properly stayed so that it cannot be pressed out by the light pressure of the fuel.

The fire bridge at (r) is very much exposed to the fire and in order to prolong its life it is wise to provide same with a canal through which air circulates.

Experiments have shown that the grate area should be about one one-hundredth of the heating surface in a plant where the draught is about one and one-quarter inches of water at the bottom of the chimney and an economiser is installed and consequently the draught at the gas inlet to the boiler is about one-half inch of water.

A larger grate area proved to combust too much of the fuel instead of transforming it into combustible gases, if the boiler was not pressed very hard, when a large loss of heat in the fuel gas occurred. A smaller grate area lowered the capacity of the boiler considerably under normal working capacity.

The grate area should, for plants of above description, but without economisers, be from 15 to 20 per cent smaller, not to let the gases escape from the boiler at too high a temperature.

In boiler plants where the draught is low, consider-

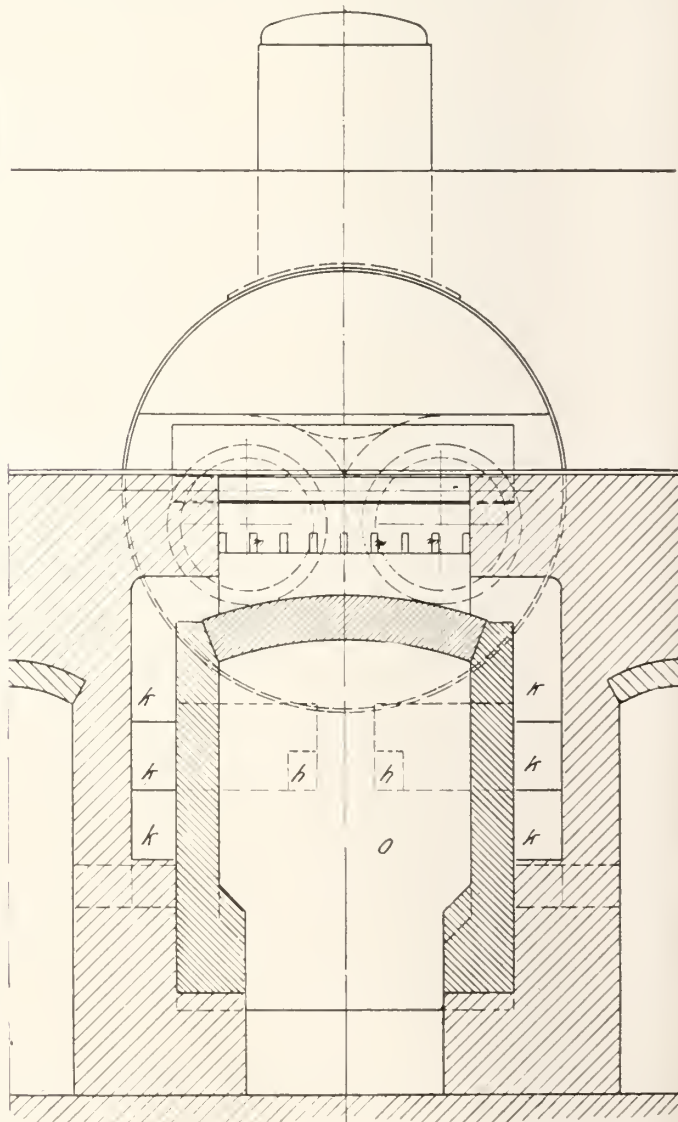


Fig III

ably larger grate area has to be provided for, and the furnace so built that the fuel does not resist the direct air too much. The secondary air canals should not be

too long, and all corners should be well rounded so as not to prevent a sufficient quantity of air to pass through.

Minute air regulation arrangements should be provided in order to get the right composition of the combustible gases and not too high percentage of surplus hot air admitted into the combustion chamber.

The arch (s) should be provided with peep holes through which the combustible gases and the combustion can be watched. The fireman will soon be able to judge from the color of the flame, how to regulate the different air inlets, especially if he has a combustion recorder to aid him.

Also ordinary Dutch ovens can conveniently be rebuilt to half-gas ovens, care should, however, be taken that the design is such that the secondary air is thoroughly mixed with the combustible gases.

The following tests were made on the furnace described above, and they do to some extent indicate the value of different kinds of refuse as fuel.

Test No.	1	2	3	4
Duration of test hrs..	4	4	4	4
Quality of fuel (see below)	1a	2a	3a	4a
Quantity of fuel lbs.	6,406	5,496	11,717	18,315
Evaporated during test: lbs. of water	28,263	14,929	28,354	22,037
Pressure aver. during test: lbs. per sq. in.	93.1	90.6	94.2	90.4
Feed water from economiser	231	228	244	274
Evaporation per sq. ft. heating surface.	6.9	3.6	6.9	5.4
Lbs. of steam per lbs. of fuel, from 32 degrees F. water to steam of boiler pressure	3.67	2.27	1.99	0.95

Quality of Fuel.

1a.—Refuse from wood room and planing mill 74.6 per cent bone dry.

2a.—Sawdust 45.5 per cent dry.

3a.—Cut up edgings and slabs stored for 6 months. 69.2 per cent bone dry.

4a.—Cut up edgings and slabs sawed in winter time and with ice on, 41.9 per cent bone dry.

BELGO DEVELOPMENTS.

The Belgo-Canadian Pulp and Paper Company's mill at Shawinigan Falls, Que., is undergoing extensive alterations and additions. The new sulphite plant is being rapidly constructed, the second digester being about one-third complete. In the magnificent modern building which has been built to accommodate stock, machine plant, screens and offices, the very finest equipment is to be seen.

A general speeding-up is being undertaken. One machine has been temporarily shut down in order to increase the rate of production to 605 feet a minute, and the other machines are to be worked to capacity. In the near future, when the new machine shop is complete, the old shop will be thrown in with the plant as part of the paper machine room, and the production of the concern considerably increased.

Mr. H. Biermaus, the General Manager, has just left on an extended trip to Europe, leaving complete authority over both construction and manufacturing ends with Mr. J. Stadler, the Assistant Manager and Chief Engineer.

Trade Inquiries

Mr. F. Daw, Trade Commissioner in Glasgow, reports that several inquiries have been made for fibre board and wall board, and evidence of interest is shown by firms interviewed, who express a desire to see samples with full particulars as to the uses, and conditions of packing, together with quotations in sterling c.i.f.

Roofing Material.

Felt roofing material is an article in common use in Britain, as is also the case with other forms of patent roofing material sold under different names, or brands. Considerable quantities are imported from Germany. A number of firms have expressed a desire to ascertain what is manufactured in Canada, in the hope that business can be opened up. It is desirable when offers are made from Canada, to place very full particulars before buyers as to the style of package, quantity, etc., if possible quoting on a c.i.f. basis, also stating if goods can be manufactured to certain requirements of this market as regards width and length.

The Department of Trade and Commerce has received numerous inquiries regarding Canadian pulp and paper products. The names of the firms making these inquiries, with their addresses can be obtained only by those specially interested in the respective commodities upon application to the Inquiries Branch, the Department of Trade and Commerce, Ottawa.

652.—Paper, Wrapping.—Samples and prices are asked for by a South African firm.

653.—Paper, Bags.—Samples and prices are asked for by a South African firm.

686.—Paper, Wrapping.—Samples with f.o.b. prices are asked for by a South African importer.

687.—Paper Bags.—Samples and f.o.b. prices are asked for by a South African merchant.

694.—Representative.—A Paris broker would gladly accept to represent in France any manufacturer or producer who may desire to open up trade.

705.—Pulp and Paper.—British house, old-established, of highest standing with first-class references, wants agency of good pulp and paper mills; cash advances and financial facilities granted.

711.—Wrapping and Toilet Paper.—A Havana firm of commission merchants is open to represent first-class Canadian manufacturers of wrapping and toilet paper.

ANOTHER PAPER MILL?

(Special to Pulp and Paper Magazine.)

Fort Frances, Ont., July 23rd.

A big real estate deal recently took place which will net the owner, Mr. Wm. Phair, a nice little amount. The property sold is all the vacant land as well as the lots where Mr. Phair resides, situated south of the Williams and Phair blocks and extending to Nelson Street. The Ontario and Minnesota Power Company are the purchasers. Just what Mr. Backus will do with it is not known, but Mr. Phair says that he believes that the company secured the land on which to build another paper mill. The purchase price is said to be \$20,000. The fact that the Power Company through Mr. Backus has purchased this property would seem to indicate that more development work of some kind is being projected by Mr. Backus. The building of another mill has long been contemplated and if Mr. Backus receives proper encouragement and assistance from the town, he says that he will build a couple of more large mills.

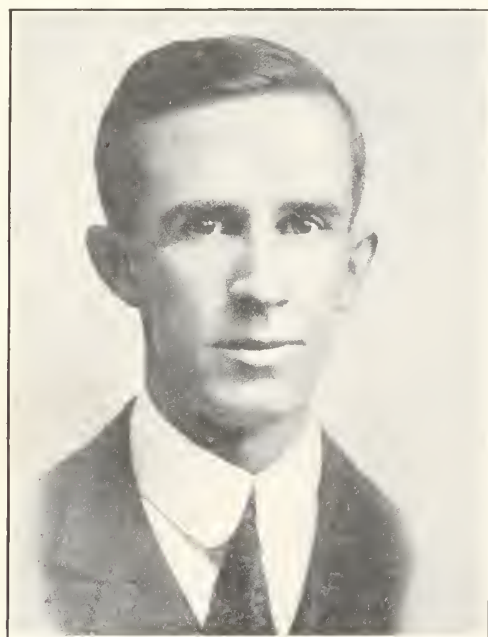
Who's Who in the Canadian Paper Industry

S. F. Duncan, Secretary-Treasurer, St. Lawrence Paper Mills Company.

By W. A. CRAICK.

Fred Duncan is one of those quiet, steady-going chaps who is perfectly convinced in his own mind that he has never done anything worth talking about in print. However, that all depends on the standard one adopts in measuring achievement. It is quite true that he may not have done anything very spectacular so far in his career, but he has forged ahead far enough in the comparatively few years he has been at work to prove that he has some of the qualities in his make-up that spell success.

Duncan was secretary-treasurer and general utility man for the Bryant Paper Company in Kalamazoo,



Michigan, when "Ike" Weldon used to blow in from the east in the interests of the Burgess Sulphite Company of Boston. "Ike" did the selling and "Fred" the buying and the pair struck up a warm friendship. The former sized up the latter as a downright capable office man; the latter reciprocated by putting all his confidence in the former as a "comer." Between these two opinions they ultimately came together on the deal by which both have to-day sailed into prominence in the Canadian paper industry.

It is a coincidence worth recording that both the president and the secretary-treasurer of the St. Lawrence Paper Mills Co. were born and brought up on the farm. Mr. Duncan first saw the light at a place called Schoolcraft in Kalamazoo County, Michigan, so he has at least one advantage over his Canadian-born colleague in that he is eligible for the U.S. Presidency. His parents were Americans, with probably a distant Scottish connection. He spent his first nineteen years alternately on the farm and at school, imbibing a variety of knowledge both theoretical and practical,—from abstruse problems in mathematics to the more useful task of milking a cow. Then like thousands of other farmers' sons, he was hired to the more ex-

citing and pleasurable life of the town. Kalamazoo was of course "the city" for that part of the state, and thither young Duncan journeyed one morning with his belongings packed in an old family trunk.

Possibly through parental influence, he got his first job in the establishment of D. C. & H. C. Reed & Co., who were engaged in the laudable undertaking of making farm implements. His work was in the shipping room where the duties of shipping clerk were imposed on him. This connection lasted between three and four years and then a new opening attracted him. A man by the name of Bryant was engaged in starting a paper manufacturing industry in Kalamazoo in the summer of 1896. He wanted a capable male stenographer; Duncan applied for the job and was accepted. From then until he severed his connection with the company in 1909, the one-time shipping clerk went ahead just about as fast as the industry itself.

The young man was about as steady and regular as a clock. To a machine-like attention to details he added an alert mind and capable faculties. He came by degrees to be depended on for carrying out executive orders. From stenographer he was promoted to bookkeeper and from bookkeeper to secretary-treasurer. The industry which had been started with a single paper machine was enlarged from time to time until, when Mr. Duncan left, it was running seven machines and twenty coating machines and was generally regarded as one of the most successful paper companies in the United States.

When the secretary-treasurer of the St. Lawrence Paper Mills Co. first came to Canada he was stationed at Cornwall in order to be near the scene of operations at the Mille Roches plant. Here he remained until about a year ago when he removed to Toronto and put his desk in the small private office of President Weldon. The pair are now in such close touch that they can, if necessary, shake hands without rising from their chairs, a proximity which must be useful when important policies are under consideration.

Mr. Duncan is a tall, slight young man, very deliberate in his actions, of a thoughtful cast of features, and a reputedly hard worker. In his manner and habits he may perhaps best be described as old-fashioned. There is absolutely no side about him. He is just a plain, steady-going office man, with a fondness for his pipe, whose day's work forms his most engrossing hobby. He doesn't go in for much fun after business hours. While he drives a motor, he isn't daft over motoring. He has been known to go fishing occasionally and also to do a little hunting in the season. He has even been induced to try his hand at lawn bowling, but these are in the nature of distractions and form as yet no regular part of his routine.

Though Mr. Duncan is not a practical papermaker, he has been long enough in the business to have absorbed a good deal of the technical knowledge of the trade. He is naturally apt with his hands and could doubtless operate a machine satisfactorily if given his time. Better than this, however, is that combined office and factory knowledge which tends towards economic production. Mr. Duncan possesses this in marked degree and this is one direction at least in which he is proving of value to his associates. He pays regular visits to the company's plants and is in close touch with their operation. In addition to his connection with the St. Lawrence Paper Mills Company, he is treasurer of the Barber Paper and Coating Mills Company and secretary of the Inter-lake Tissue Mills. In the new Provincial Paper Mills Company, he holds the office of secretary-treasurer.

Correspondence

PAPER MAKING INDUSTRY IN SOUTH AFRICA.

Editor, Pulp and Paper Magazine:

Having observed the paragraph on above in your issue of 1st July and having some considerable knowledge of the possibilities of Paper Manufacture in South Africa from a special visit to that country to ascertain same, some years ago, I think it may be of interest to some of your readers to give a short summary of my experience there, and the conclusions I arrived at after a very careful examination of various localities and existing conditions.

Taking the consumption of paper first. Unquestionably there is an opening for a Mill making News Print and various grades of wrapping paper (say one machine for each to start with), but there is not sufficient demand for fine papers to call for a mill making either writings or book paper.

Regarding position for such a mill. My opinion is that, to be successful, it must be on or very near the coast, because wages are considerably lower than up country. Machinery and chemicals would cost considerably less at the mill. Materials could be collected cheaply from the various important coast towns and brought to mill almost entirely by sea. Again, by being on the coast, full advantages are obtained of what are called Colonial Produce Rates. These are special and very much reduced rates charged by the Government Railways on articles made in the country, as against the same articles imported. The full advantage of these rates would be obtained by being situated on the coast, and there would also be the advantage of water carriage to all the important coast towns.

Further, a mill would cost less to build on the coast, also (and this is an important matter in S. A.), one would be free from pollution troubles. It must be remembered that water is none too plentiful in South Africa, and if a mill was situated on a river any distance up country, in the dry season when most of the rivers are mere dribbles, it would be quite a sure thing that every death among the cattle all the way down stream would be charged against the paper mill, and there would be continuous worry and expense over claims for damage and compensation.

Next comes the question of Power. First, it may at once be stated that water power is out of the question, simply because it is not to be had with any regularity at any accessible point. Therefore, we have to fall back on steam, which means coal. There is coal in Cape Colony, but it is a long way from the coast and the quality is certainly inferior. In Natal there is better coal, but here also it is a long way from the coast. In Zulu Land, just over the border of Natal, there is good steam coal in quantity and it is near the coast. This would seem to be the best source of fuel supply.

Next we come to the important point of Water Supply. Here I think we may dismiss Cape Colony, for there, although some considerable rivers are shown on the maps, there is very little water in them during the dry season and great floods in the wet season, which run off very rapidly indeed.

In Natal there is not nearly so much variation in the flow of the rivers and sites could be obtained on the coast there with railway accommodation, and ample supply of manufacturing water of good quality can be obtained all the year round.

Now comes the question of Material. It is an accepted fact that paper can be most profitably made from

articles which are of practically no use for any other purpose.

In South Africa the waste of all the towns is simply collected and burned. Among this waste are large quantities of various grades of good papermaking material, such as rags, ropes, canvas bagging and waste papers. All these could be obtained for little more than the cost of collection and freight to mill. But this source, although very valuable, could not be relied upon entirely for the supply of sufficient raw material to keep even a medium-sized mill in full work; therefore, it is necessary to look round for some natural fibre.

In the paragraph in your last issue Veldt grass is referred to. This the writer tested thoroughly some years ago, both personally and by a leading chemist, but the verdict was that it was not so good as Esparto, as far as fibre went, and the yield of fibre per ton of dry grass was considerably less. Besides, the cost of collecting was so heavy as to put it out of consideration altogether. There are many fibres growing in South Africa which would make paper, but they are with two exceptions—not in sufficient quantity, or they cost too much to collect.

The first of these fibres is the sugar cane waste from the sugar factories in Natal; this is called Megrass or Bagasse. It is used for fuel by these factories, but the proprietors would gladly substitute coal for this waste if they could get rid of it for some other purpose at its fuel value. There are large quantities of this produced in a comparatively small area.

It is well known that this material has been experimented with in various places, and not, so far as we know, with great success. In the writer's opinion the trouble is—that in sugar cane countries, other than Natal, the crushing season is over in six weeks or so, while in Natal the crushing goes on for about nine months. From the writer's experience in handling Megrass, it is necessary, if a good white pulp is to be obtained, to get the material fresh from the crushing mill; otherwise it will not come to a direct color, with any reasonable percentage of bleach. Presumably, the residue of sugar left in the crushed cane ferments and turns the fibre brown in such a way that it cannot be bleached economically and therefore the resultant pulp is only fit for use in brown papers.

This Megrass, when handled fresh from the crushers, is more easily boiled than Esparto and certainly no more difficult to bleach.

The second fibre is the Papyrus reed; it grows in large quantities on the Zululand coast, just over the Natal border, and between the railway and the sea. This reed is just right for cutting when the Megrass season is over, and it can be easily and cheaply collected. To reduce it to pulp, the same machinery and process as that used for Megrass would be suitable.

We now come to the question of Labour. In Cape Colony unskilled labour is costly, and none of the native tribes have so far taken kindly to factory work, but in Natal, while the same remark applies to the natives, there is a large population of Indians of the Coolie class who work in the cane fields. They are cheap and easily taught routine work. Wherever a mill was built the skilled labour would require to be imported, but as the cost of living is much less on the coast than up country it follows that the rate of wages is lowest on the coast.

Lime, which is a very necessary article if boiling is done by soda process, is obtainable, of the very highest quality, made from pure white marble, obtainable near Durban. There are also said to be deposits of that

useful article, China Clay, and there is plenty ochre if required for coloring or loading purposes.

Mill buildings in South Africa need not be costly, as the climate is such that little more is needed than sufficient to protect machinery and workers from sun, wind and rain.

Anyone starting a paper mill in South Africa might have every confidence in getting all the help and assistance that the government could give them. Indeed, in Natal there is a law offering quite a considerable bonus to the first person starting a paper mill and making a comparatively small amount of paper within a year of starting.

In conclusion, the above is simply a plain statement of facts as ascertained by personal observation and enquiry from all sorts of people on the spot. The writer is quite of opinion that there is a good opening for a paper mill in South Africa and he, knowing the conditions, has often been surprised that one has not been started before. The best place to start would, in the writer's opinion, be on the coast line of Natal, near Durban.

ALEX. ANNANDALE.

Ascertaining The Machine Direction of Paper

SINDALL and BACON in The Paper Makers' Monthly Journal.

There are several methods for determining the machine and cross directions of paper, and it seems almost impossible to find anything really new to say about the subject. At the same time, a summary of the various methods in use may be of convenience to our readers who desire to compare one method with another.

With thin printing papers made from esparto it is not a difficult matter to detect the machine direction by the appearance of the paper when a sheet is interposed between the observer and a strong light. In such cases the wire marks are very prominent, and the sheet appears to be dotted all over with diamonds. The sharp pointed angles all point in the machine direction, while the more obtuse angles show the cross direction.

With very coarse papers, and with mottled papers, the surface appearance of the paper can be relied on to a very large extent as indicating the machine direction. The parallelism of the fibres is very distinctly marked, especially in mottled papers. It is quite simple to determine not only the machine direction of the paper, but also the under side of the sheet. The mottled fibres are much more parallel to one another in the machine on the under side of the sheet than on the topside, where the shake of the wire has exercised a greater influence on the disposition of the fibres.

With coarse news paper the same conditions hold, and the direction of the fibres is easily determined with these. A cloudiness of the fibres nearly always appears in cheap papers, due to the formation of apparent stripes in the sheet. This may largely be traced to the dirty condition of the machine wires.

The curling up of a circular piece of paper when the latter is damped on one side is perhaps one of the simplest tests, and one which is most frequently applied. The axis of the little tube into which the paper is curled by the expansion of the fibres due to damping indicates the machine direction of the paper.

Nickel's method of placing two strips of equal length on one another, and holding them in the air between the finger and thumb, is perhaps the most ingenious. This method has been illustrated in all text books, and no detailed description is needed. If the under strip is strong enough to support the top strip, it indicates the machine or stronger direction of the paper.

Resz some years ago published a simple method based on the unequal expansion of the paper in the two directions when dipped into water. The principle involved is the same as that which operates in the case of the circular piece. It is claimed for this method that it has the advantage of being applicable to samples which must not be cut or destroyed. The edge of the sheet is dipped perpendicularly into water and immersed for about half-a-minute. The edge of the paper when cut in the cross direction rapidly assumes a very wavy appearance, whereas in the case of the machine direction the waviness is not so marked, if at all.

Frequently this behaviour of paper on damping can be taken advantage of by merely dipping a corner of the sheet itself into water so that at least an inch or an inch and a half along each edge is wetted. Close observation of the behavior of the two edges at the corner frequently indicates the machine direction of the paper.

The actual determination of the exact machine and cross directions in a sheet of paper is not always a matter of importance. Generally speaking, the paper is cut square or parallel to one of the directions, so that it is safe to assume for purposes of strength tests that the line of maximum strength is the machine direction. As a matter of interest we might mention that with certain classes of paper it becomes necessary to guard against the paper being cut at an angle so that the apparent square edges of the sheet are possibly at an angle of 45 degrees to the machine direction. One instance of this is to be found in paper used for envelopes. If it is assumed that one of the edges of such a sheet is strictly parallel either to the machine or cross direction, mistakes may occur. On the other hand, the mere fact that the strengths in the two directions under such an assumption are practically the same, should create the suspicion that the assumption is incorrect. A test for the machine direction would then have to be made in order to find the exact angle for maximum strength and minimum strength. If a number of strips are cut radiating from some common center and examined for strength, the position of the machine direction can be found by purely physical tests of tension, though we need hardly resort to such lengthy and cumbersome process in view of the simple and effective devices referred to above.

The action entered against the Spanish River Pulp and Paper Co., by the Rateliff Paper Co., of Toronto, to recover the sum of \$25,000 for non-performance of contract in connection with an order placed by the latter for some fourteen hundred tons of Manila No. 2 as well as a quantity of fibre and Manila No. 1 papers has been settled out of court. The paper was to have been manufactured at Sturgeon Falls plant and, after delivery of some 500 tons, no further shipments were forthcoming, the Rateliff Paper Co. received in the neighborhood of \$10,000 in adjustment of their claim.

George Powley and Co. have started in the business of wholesale paper merchants, at 1311 Queen Street West, Toronto, and are carrying a stock of wrapping, bags, twines, toilet paper, butter and pie plates. The sales manager of the company is James Donohue.

Ottawa Notes

Ottawa, Ont., July 25.—As the result of a break in a flume wall over a week ago, three of the mills of the J. R. Booth lumber and paper manufacturing company are temporarily out of commission, and some 500 workmen are deprived of employment. The accident occurred from some weakness in the wall and as a result the saw and board mills and one of the pulp mills of the company stopped running, though No. 1 pulp mill, the paper mill and the sulphite mill were not affected and are still in operation. The damage is expected to be repaired within a week's time. The Booth plant has been rather unfortunate in the way of accidents during the past year, a number of them having occurred and one having nearly terminated the activities of Mr. J. R. Booth himself.

* * *

The Ottawa river is again beginning to drop after its recent sudden increase following the breaking of the Temiskaming dam, and the heavy rains which followed the spell of very dry weather. The fact that the dam at Temiskaming is now well on the way to repair and the flow of water through the gap in the big structure has been stopped is partly responsible for this. However, most of the mills have managed to get their logs down during the high level period. On the Gatineau River conditions are now reported to be very good. The recent rains have had more effect on this stream than on the Ottawa, and large booms of logs and pulpwood have been brought down during the past few weeks. It is stated by the mill owners who a few weeks ago were predicting a close-down, that they now have enough timber to keep them busy during the summer.

The part that its lumbermen and paper manufacturers play in the city of Ottawa's affairs, although the Capital has outgrown its former appellation of the "lumber town" is illustrated by the manner in which J. R. Booth stepped into the breach caused by the breakdown of the pumps at the city's waterworks a week ago. The accident left the city without fire pressure and without means of fighting fire to a certain extent, since to increase the pressure as much as possible all the available fire engines had been attached to the mains. Mr. Booth, however, arranged in case of emergency to close down his mills and use his power to supply an extra amount of four million gallons of water.

* * *

The Lake of the Woods Boom Company has given notice that it will shortly apply to the Government for approval of the plans and site of a boom which is to be built by the private interests represented in the bed of the Rainy River opposite the Wild Lands reserve. A number of lumber and pulp and paper companies are interested in the structure for which plans have already been filed with the Minister of Public Works at Ottawa.

* * *

By the middle of August between 35,000 and 40,000 men will be working in the lumber camps in the timber limits owned and operated by Ottawa Valley lumber and pulp and paper manufacturers. The firm of J. R. Booth will have close to 4,000 men working in about 35 camps. A good deal of spruce, much more than was cut last year, will be taken out this season.

* * *

Authority has been secured from the Department of the Interior by The William Cauldwell Paper Com-

pany Ltd., to change the name to the Beveridge Paper Company, Ltd. The Canada Gazette has published the official notice of the incorporation of a new pulp and paper company with a capitalization of \$100,000 to be known as the Chaleurs Bay Pulp and Paper Company Ltd. The head office of the company will be at at Sherbrooke, Que. MacCORMAC.

Pulp and Paper Conditions in Scandinavia

Mr. C. E. Sontum, Canadian Commercial Agent, says in his report of July 3rd, that according to an article, which has appeared in a number of papers, the directors for the Labro Wood Pulp Mill have made a contract, whereby this mill has sold some 400,000 tons of pulp in one deal. The above mill is owned by the city of Drammen, and is rented out to a stock company, whose contract has still 22 years left to run. The sale of pulp, which this company has just made to an English paper factory, embraces all the production of wood pulp, which the company will be making during the coming 22 years.

The sale price is based, it is stated, on the present cost of production, but the sellers have reserved for themselves the right to raise or lower the price, if the cost of production during the next 22 years should undergo any marked change. The mill employs at present about 80 hands, and the yearly production is calculated to be from 18,000 to 20,000 tons of moist pulp. The total amount of the contract is reported to be in the neighborhood of four million dollars.

In connection with the Centenary Exhibition of Norway now being held at Christiania, the Norwegian Wood Pulp Association, the Norwegian Cellulose Association and the Norwegian Paper Makers' Association have sent out a pamphlet which closes with the following resume of conditions in this industry:—

"The Norwegian wood pulp and paper industry has a capital of at least 100 million kroner (26.7 million dollars) and at present employs 14,000 working men. The products of these industries represent nearly one-half the value of the industrial exports of the country. Circumstances, however, brought it about, that these lines of industry are laboring under even poorer working-conditions, and are finding it difficult to keep pace with the competition from other pulp and paper producing countries. The costs of production, especially the price of lumber have been continually rising, while the price of the ready made product has been declining. It is feared therefore that if conditions are not soon bettered, these industries will find it increasingly difficult to continue.

At Stjordalen near the city of Dronheim there is a proposal to start a new pulp and paper mill at a cost of about 300,000 dollars and with a yearly capacity of 4,000 tons of 40 grammes printing paper and 6,000 tons of wood pulp. The most modern machinery will be put in.

A strike has been going on for some time among the log sorters at Sandlaus sorting place in the Anderman river where some 800 men have struck work. As some ten million logs have to pass this sorting place each year, the importance of this strike may be realized. Five small saw-mills have already been compelled to stop work from want of logs, and if the stoppage lasts others will be compelled to follow suit, and it is feared that the entire business of the district will be dislocated. A similar conflict has also broken out in the Ljunga river by Sumasvall and it is feared that the strike may extend to the Indals river. Such a strike

at the sorting places if it is continued for some time may have the most serious influence upon the output of the Swedish sawing mills, since the logs cannot be brought down to the mills.

Large areas of forests are at present burning in the Oesterdalen, one of the best forest districts of Norway. Two hundred and fifty acres of valuable forest lands have already been destroyed. The fire was caused by sparks from a railway engine.

The Swedish Pulp Market.

The "Svensk Export" reports that the sales of sulphite are limited to only prompt deliveries. The late fall in the prices does not seem to have had any influence on the sales. The makers are of opinion, that the United States ought to soon appear on the market as buyers. Contracts for delivery during 1915 are being discussed. The fall in the price of sulphite has caused some increased interest among the buyers. The mills have reduced their stocks of mechanical, though here also there is noticeable some interest among buyers.

Swedish Paper Industry.

Three of the largest paper mills in the midlands of Sweden have recently bought large areas of forests to a value of nearly 1¼ million dollars. In this way the Swedish paper mills are trying to consolidate their future production.

WOOD PULP IMPORTS IN MAY.

(Special to Pulp and Paper Magazine.)

Washington, D.C., July 25th, 1914.

The monthly summary of the Department of Commercial Bureau of Foreign and Domestic Commerce, for the month of May, and for the eleven months ended May 31, 1914, has just been issued. This report shows total importations of wood pulp during May, 1914, into the United States of 89,214,185 lbs., valued at \$1,373,856. This is only a slight increase over the importations in May, 1913 (84,743,165 lbs., valued at \$1,367,794). Canada led the other countries in exporting wood pulp into the United States during this period. Of the total, her share was 43,224,037 lbs., valued at \$518,312. Of the total in May, 1913, Canada's share was 29,052,968 lbs., valued at \$344,731, which shows that the pro rate of increase from Canada was far greater than the general increase.

The distribution of the importation of pulp in May, 1913-1914 follow:

	1913.		1914.	
	Lbs.	Dollars.	Lbs.	Dollars.
Germany	11,722,716	215,848	16,396,163	285,732
Norway	23,718,428	480,201	14,641,327	300,339
Sweden	19,104,111	307,057	12,611,044	225,336
Canada	29,052,968	344,731	43,224,037	518,312
Other				
Countries	1,144,942	19,957	2,341,614	44,137
Total	84,743,165	1,367,794	89,214,185	1,373,856

For the eleven months ended May 31, 1914, the importations totalled 1,031,135,087 lbs., valued at \$15,378,411, which is compared with the corresponding periods of 1913 and 1912, respectively, as follows:—1,053,374,397 lbs., valued at \$15,102,158, and 981,662,962 lbs. valued at \$13,052,247. In each case Canada's share was greatly in excess of that of any other country—she imported during the eleven months in each year as follows:

	Valued at
1914	474,615,105 \$5,328,780

1913	431,749,555	4,607,928
1912	429,550,915	4,353,655

Importations for the eleven months period of 1914 recorded Sweden second with 238,875,852 lbs. valued at \$3,935,355; Norway, third, with 164,781,015 lbs., valued at \$3,365,172, and Germany fourth, with 135,743,028 lbs., valued at \$2,447,193. The remaining importations consisting of 17,120,107 lbs., valued at \$301,911, came from several other smaller exporting countries.

The 89 million odd pounds of wood pulp brought in during May, 1914, consisted of 25,846,630 lbs. of mechanically ground wood valued at \$191,219; 45,898,527 lbs. of chemical unbleached valued at \$775,269; and 17,469,028 lbs. of chemical bleached, valued at \$407,368. All of these importations came in free of duty. Similar figures for the eleven months ended May 31, 1914, are:

	Lbs.	Valued at
Mechanically ground wood..	323,529,678	\$2,497,783
Chemical unbleached	546,408,621	9,110,592
Chemical bleached	161,196,788	3,769,036
Total	1,031,135,087	\$15,378,411

WAYAGAMACK PULP AND PAPER COMPANY.

Net profits of \$193,903 for the year ended June 30 last, were made by the Wayagamack Pulp and Paper Company. This compares with \$151,773 last year, a gain in 1913, therefore, of about 28 per cent over the profits of 1912. The report presented at the company's annual meeting last week, is the first in respect of a full year's working of the company's pulp mill, the statement to June 30, 1913, covering only six months' operation of this department, although representing a full year's lumbering activity.

The company's current liabilities on June 30, 1914, were \$879,065, as against \$436,959 on the same date a year ago, an increase of \$442,106. Liquid assets amounted to \$700,281, as against \$601,284 the previous year. The increase in current liabilities is due to an increase of \$372,151 in bank loans. Reserves against lumbering operations and contingencies stood at \$79,146 on June 30 last, as compared with \$168,266. Buildings, plant and machinery are held at \$2,432,656, an increase of \$354,872 over 1913.

The following table shows the profit and loss account as at June 30 of both years:—

	1914.	1913.
Earnings for year	\$403,903	\$256,773
Bond interest	210,000	105,206
Net profits	\$193,903	\$151,773
Balance from previous year..	151,773	.....
Balance at credit	\$345,677	\$151,773

The earnings for the year, after providing for all charges and expenses of administration, were \$403,903, as compared with \$256,773, an increase of \$147,130, but as bond interest in 1913-14 was double that of 1912-13, the net showing did not increase in proportion with the gross. The heavier interest obligations were due to an issue of \$500,000 of the company's bonds prior to the close of the first fiscal year. The balance at the credit of profit and loss, \$345,773, is about 6.90 per cent on the \$5,000,000 common stock outstanding.

In view of the industrial conditions prevailing, the report is a satisfactory one.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The American Paper and Pulp Association which for a number of years has been located at 50 Church Street, New York, has joined the uptown movement. New executive offices have been leased on the sixth floor of 18 East 41st Street. This movement is brought about by several reasons. First: quarters in the close vicinity of the Grand Central station would be much more convenient to its members. and second, the Erie R.R. Company has been desirous for some time past of securing the suite now occupied by the association in the Hudson Terminal. The association has subsequently sub-leased this space to the Erie R.R. The paper trade started the uptown movement several years ago. Among the larger concerns now located in the Grand Central district are: Great Northern Paper Co., Manufacturers Paper Co., Grand Lake Company, Perkins-Goodwin Company, M. Gottesman and Son, and Mileson Rautoul and Company.

* * *

The Jassup and Moore Paper Company with six paper and pulp mills and offices in New York, Philadelphia, Boston, Elkton, Md., and Wilmington, has been incorporated under the laws of Massachusetts with a capital of \$3,000,000, consisting of 10,000 shares of 7 per cent. cumulative first preferred, 7,500 shares of 7 per cent. cumulative second preferred and 12,500 shares of common stock. The incorporators are G. Barker, P. E. Atkinson, I. V. Brock, A. C. Gould, E. C. Fisher, G. R. Merrill and W. J. Martin.

The real estate includes the Augustine Mills, Wilmington, Del.; the Rockland Mills and Delaware Soda Fibre Pulp Mills, Christiana Hundred, Del.; Chester Mills, Coatesville, Pa., Radnor Pulp Mills, Elkton, Md., and Kenmore Paper Mills, Providence, Md.

* * *

A meeting of the unsecured creditors of the American Paper Co., of Bogota, N.J., was held on Tuesday, July 14, at 320 Broadway, New York. The meeting was attended by the majority of the creditors, and the chairman of the committee, D. J. O'Connell, of the Box Board and Lining Co., presided. Reports were read showing the condition of the defunct concern, and in view of the probabilities of reorganization it was agreed to allow the mill to be operated under the temporary receivership, who in turn reported doing a fair business. It is very evident that from the interest taken by the creditors at this meeting, their welfare will be safely guarded, and through this committee, if there is any possible chance of protecting creditors' claims, it will be done through the able work of the chairman.

* * *

Several tremendous bolts of lightning in a storm that swept over Detroit, Mich., on the morning of July 13, started a fire that completely destroyed the Chape-Steven Paper Company's building at 12-18 East Woodbridge Street. The plant of the paper company was a roaring furnace from the basement to the roof of the sixth floor. The fire appeared to spread with amazing rapidity, as though the lightning had descended from the skies and pierced the structure from roof to cellar.

The flames were first seen on the top floor near the rear. A few minutes later they burst out from the other floors and the firemen were forced to try immediately to protect neighboring structures, and to confine the conflagration to the building occupied by the paper company.

Robert L. Chope, vice-president and secretary of the company, estimated that the stock in the building was worth \$125,000, of which the loss would probably be complete. He did not know what the building was worth, but thought it would equal the same sum.

* * *

The Sterling Paper Company, of Hamilton, Ohio, has just been petitioned in bankruptcy by Jacob Hyman, Phillip Levy and Sons, and Kempner Bros., all rag dealers of Louisville, Ky. The schedule filed shows liabilities of about \$300,000 and assets consisting of land, buildings, machinery, etc., will probable aggregate the same amount. J. Howard Friend is president of the company, and it is said that this mill is one of the most complete of its kind. Later reports indicate that plans are under way for the reorganization of this company but nothing definite can as yet be ascertained.

* * *

The Federal Government's world wide exhibit of pulp and paper manufacturing compiled from statistics and samples picked up by the representatives of consular department in far corners of the globe, is to go to Watertown, N.Y. Announcement to this effect was received last week by the chamber of commerce in a letter from the Bureau of Foreign and Domestic Commerce of the Department of Commerce at Washington. The chamber made application to have Watertown included in the list of cities to be visited by the exhibit, and the Bureau of Foreign and Domestic Commerce advises that at the expiration of the present itinerary of the exhibit it will be sent here for display.

The present schedule of the exhibits' travels, as outlined by the bureau, consumes all of the time up to November 25. It is now at Holyoke, Mass., and after taking in the principal points of New England, including Boston and Portland, Me., will go to New York City, Philadelphia and work west to Chicago, Minneapolis, San Francisco and back to New Orleans.

The display is made up of manuscripts from the consular report on pulp and paper manufacture, together with stationery, supplies and samples thereof. The whole world is represented, including South America, Europe, Asia, British India and the larger islands.

* * *

Judge W. Rush Gillan of Waynesboro, Pa., has suspended the preliminary injunction in the Hollywell Paper Mill case at Chambersburg until September 10. He gives the plaintiff the right to move to have the injunction restated at any time that the water of the Conococheague creek shall render his live sock, by the drinking of it, sick. There is a lot of stock to be worked up at the mill, and this will be a loss if the factory cannot be operated.

A \$20,000 fire recently occurred at Skowhegan, Me., when the Riverside pulp mill of the Skowhegan Pulp Company was destroyed with most of its machinery. The fire was caused by an overheated bearing under the grinder machine, followed by an explosion. The building quickly filled with smoke and the crew was obliged to leave without shutting down the machinery. Fifteen men, working on day and night shifts, are thrown out of work indefinitely. The mill was owned by Charles Young, superintendent, and Blin W. Page, and was insured for \$14,000. Mr. Young stated Friday night that he was undecided about rebuilding.

* * *

A meeting of the creditors of Goldberg and Co., of 2026 to 2032 Pacific street, Brooklyn, N.Y., manufacturers of corrugated paper boxes, was held on July 13 last, at which an extension of time was asked for the payment of the creditors who it is believed are owed between 7,000 and 8,000. It is expected that the extension of time will be granted. The running expenses of the plant will be reduced by the renting of the one or two floors in the building occupied.

* * *

The Schmidt and Ault Paper Company, of York, Pa., announced last week that the work of remodeling and enlarging its mill at York had been completed, and operations are now being carried on at full capacity. The mill is one of the largest and most modern of its kind in its section of the state. At the annual meeting of the company held at its offices a week ago, John C. Schmidt was re-elected president; Robert A. C. Ault, treasurer and general manager, and Henry D. Schmidt, secretary.

The plant is now operating three paper machines, two of them being known as double-width Fourdrinier machines, used in the manufacture of wrapping paper. The third was the only machine in the mill when the present company took over the plant 18 years ago. The original machine has long since been rebuilt and added to by the addition of the latest appliances, but compared with the new 84-inch Fourdrinier machines it looks diminutive. It was in 1903 that the second machine was installed, and 10 years afterward the installation of the third machine was first undertaken.

In order to effect these changes, it was necessary to acquire additional property so that the incoming and outgoing material could be handled directly on the cars at the mill instead of some 600 or 800 feet away. The work of constructing a large building over existing buildings, and operating machinery while the building was being erected and the old one torn down, required the greatest care and watchfulness. Although this work has been in progress for more than a year, it was successfully carried through unmarred by any accident to life or limb of employes working in and about the mill.

In building these additions the management had in mind the danger from fire, and new floors of concrete were substituted for wood. The walls of the building are built of fireproof construction-steel frame, with brick and concrete walls, iron window sashes and slow-burning mill construction wherever it was absolutely necessary to use wood. As an additional safeguard, an extensive sprinkler system has been installed. Additional facilities were added in every department, and the mill is being operated with a combined power plant of steam, electricity and water, of approximately 1,200 horsepower. The plant occupies about nine acres.

* * *

The paper manufacturing plant of the Newington

Board Company at Newington, Conn., was sold at public auction by Deputy Sheriff Chas. H. Latham, July 16 to satisfy a judgment for \$8,923.82 held by P. Garoun, Inc., Texas, and costs were added to the judgment, and the equity in the property sold to P. Gavan, Inc., for \$1.

* * *

A committee of the employees of the Windsor Locks Paper Company called on J. P. O'Brien, on July 17, who recently resigned as superintendent of the mill at Windsor Locks, Conn. After fourteen years' service, Horace Daub, chairman of the committee, gave him a handsome gold watch and spoke of the friendship those present bore him.

The United States Envelope Company has put its common stock on a 7 per cent basis, alongside the preferred.

* * *

The Anchor Mills at Windsor Locks, Conn., one of the oldest paper manufacturing concerns in the country, has closed indefinitely. The mill was built long before the civil war and held a contract with the New York Herald in 1861 when it was transformed into a woollen mill and continued as such until 1890. In that year it was again made into a paper mill. It is believed that the mill will soon be started up again, as several interested parties have been looking over the property.

* * *

According to reports, it is evident that the International Paper Company, of 30 Broad Street, New York, is doing better than 90 per cent of a normal business. While prices of newsprint are somewhat lower than they were at this time last year; there is no doubt that the margin of profit will be such as to permit of the continuance of the 2 per cent dividend on the preferred stock. Profits of between 2 and 3 per cent would seem to be a reasonable expectation for this year.

* * *

A telegraphic dispatch from Bangor, Me., states that the East Branch log drive has just arrived at the Argyle Boom with about 42,000,000 feet, and is now being rafted at the rate of a million feet a day. From the West Branch this year there are about 18,000,000 feet of saw logs, the remainder being owned by the Great Northern Paper Company and stopped at Shad Pond.

* * *

The Auburn Paper Box Co., of Lewiston, Me., made an assignment on July 16. It was definitely stated by those interested, however, that the business would not be closed down as there were orders on hand, and many more coming in.

FALLING OFF IN BOOK IN U.S.

New York, July 29.

Mill reports for the manufacture of book papers in this country during the past six months show that there was an average of about 3 per cent falling off in the normal production of this grade of paper. At least 98 per cent of the actual output of the book mills was shipped each month. The best month in this industry was March, when 98 per cent of the normal output was manufactured and 100 per cent of this output was shipped. There was a firm market value throughout the period, and the conditions of this branch of the paper industry was healthy every month. It is generally believed that the fall will bring an advance in the value of all grades of book papers.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, July 20, 1914.

A scientific exposition of the uses of paper as a hygienic substitute for washable articles in daily use was given last week at the Sanitary Congress, which assembled at Blackpool, the favorite watering place in the North of England. Specimens of paper suitable for cookery purposes, along with the various qualities likely to be useful for table napkins, tablecloths, plates and towels, were exhibited and lectures were delivered by Mr. Samuel Rideal of London, who is an expert on the uses of paper for hygienic purposes. The exposition and lectures were most interesting, and Mr. Rideal pointed out that the great railway system, known as the London and North Western Railway of England, had now adopted paper towels and plates on all dining cars and on all passenger trains where there were lavatories. Mrs. Clondesley Brereton, of London, sprang a surprise on the congress when she asserted that the old-fashioned wire cover, or thin perforated wire screen, used for covering meat in sultry weather, was not of the slightest use as a protection against flies. The only way, she said, to prevent the fly laying its eggs on food was to wrap the meat in impervious paper. For hygienic use there is a growing demand for suitable paper in the United Kingdom and papermakers will eventually have to give the subject greater attention than they are doing at the present time.

* * *

The annual report of Mr. C. Hamilton Wickes, the trade Commissioner for the Dominion of Canada and Newfoundland, has been received by the Trade Board of London. He states: "The position held by the United Kingdom is, on the whole, encouraging and I am confident that it will improve as the conditions relating to distribution in Canada become better understood by the manufacturer—and of his efforts in this direction there is definite confirmation. The value of the United Kingdom manufactures imported into Canada in 1913 exceeded by 29 per cent that of the previous year, this notwithstanding the great general demands for their products enjoyed by British manufacturers during this period; while here in Canada the active competition of the United States, Germany and other countries had to be met; and it should not be forgotten also, many of our great manufacturers are from a variety of causes precluded entirely from offering their manufactures or competing on the Canadian market." Mr. Wickes points out that the Canadians rather like the production of the British manufacturers, but the difficulties of doing business, not only once, but continually, finally determines the Canadian buyer to buy as little as possible from the United Kingdom, and certainly to avoid introducing any other lines than those which they were compelled to stock. The report is a very interesting document, and it deals at some length on the advantages enjoyed by the United States in trade with Canada, particularly the rapid access to the markets and the freightage.

* * *

Fire broke out on July 10 at the premises of Messrs. F. W. Howarth, wall paper manufacturers, Blackley, Manchester, and from the outset the buildings were doomed to destruction, the damage done being esti-

mated at between \$288,000 and \$330,000. So serious was the fire that all the fire-fighters in Manchester City were required to prevent the flames from reaching adjoining buildings, amongst which was a large chemical factory. When all was over only the shell of the paper building was left, but one of the walls soon collapsed and two firemen were killed. A slight outbreak of fire, supposed to be caused by spontaneous combustion, occurred on the same night at the Mugre-moss paper works, near Aberdeen. The fire took place in a heap of about 15 tons of oily waste stored outside one of the main buildings. In less than ten minutes' time the paper mill fire fighters had the outbreak well in hand, and succeeded in keeping the flames from spreading in the mill. The damage done is estimated at \$240. While writing on fires, attention should be directed to the serious explosion that paper dust will cause. The Chief Inspector of Factories in England says that the last paper dust explosion at Lille, France, was caused by a naked light in a chamber where the dust was collected during the process of making paper tubes. The edges of the paper from which the tubes were made were ground down on an emery covered roller, and then the dust was exhausted by means of a fan into the chamber. In consequence of this explosion, the Inspector says he has given instructions to remedy faulty conditions in the English factories.

* * *

The members of the National Union of Paper Workers' have been giving the paper mills in the South of England considerable attention lately, and they are determined to make all mills become "trade union mills." At St. Paul Cray paper mill, in Kent, 140 workers have struck work and the men are demanding a minimum wage of \$3.50 a week, and women \$3.10 a week. The mill is owned by Mr. W. Nash, who makes a good deal of paper for the British India Office in London. Wm. Coates, the fighting organizer of the Paper Workers' Union, says that government paper must be made in accordance with the fair wage clause in the contract and he alleges that Mr. Nash has broken the contract by not paying the minimum wages. Mr. Nash, in reply, says he has always fulfilled the contracts properly and he was never against any of his workers joining a trade union; but he was determined that he would never submit to his mill being termed a "trade union mill." That is, he would not agree to placing the trade union label on every piece of paper turned out at the mill to show that trade union hands made it. While all these disputes are being discussed, the workers are out on strike pay, and the union officials are using strong language and threatening to have a government inquiry demanded into the grievances they complain of.

* * *

The letter from Mr. Alex Annandale in the Pulp and Paper Magazine of July 1st is most interesting. Of late years the British paper mill owners are manifesting a greater interest in their mill hands by establishing clubs, or helping the workers to establish them, as by this means they succeed in retaining first-class workers. In the summer time outdoor sports of all sorts are catered and then at least one day and one night a mill is closed down and the workers take a trip to

the sea-side, or the country, as the case may be. This trip is sometimes provided free by the mill owners, whilst in other cases a collector is appointed and he takes a dollar or more off each employee, and with the total sum a train is chartered for the day for some resort. Usually the mill owners subsidises the dollar, or, perhaps, provides all refreshments and food for the day in a hotel. By this means a break in the year's work is greatly enjoyed and the summer evenings for those on day work are spent in healthy outdoor exercises. In the winter time there are indoor games. Some mills have several concerts, or theatricals; some have bands, and at Christmas time there is at most of the mills a gathering round the festive board to do justice to a good substantial dinner. These social functions bring the mill owners and mill workers closer together, and they tend to promote a good feeling amongst all parties. As Mr. Annandale rightly points out, "all work and no play makes Jack a dull boy," and it is gratifying to know that the majority of the British mill owners are believers in this motto.

* * *

The British paper trade has not yet recovered itself from the depression that has prevailed since December last. The following figures show the imports and exports of writing and printing paper, boards, paper hangings, cards, envelopes, bags and enumerated papers for the month of June:—

	1913.	1913.	1914.	1914.
	Cwts.	£	Cwts.	£
Imports ..	1,034,636	620,826	1,002,517	593,935
Exports ..	277,039	294,041	281,472	284,619

It will be seen that while the exports in June were greater than those of June, 1913, the values are less during the same comparative periods, which, probably, may have something to do with price-cutting. The imports and exports for six months—December to June—now stand as follows:—

	1913.	1913.	1914.	1914.
	Cwts.	£	Cwts.	£
Imports ..	6,198,700	3,686,633	6,026,743	3,666,783
Exports ..	1,775,621	1,888,828	1,703,953	1,752,450

The six months' exports to Canada from British mills were as follows:—Writing paper: 2,047 cwts., compared with 3,393 cwts. for same period in 1913. Printing paper: 47,390 cwts. compared with 67,492 cwts. Unenumerated classes of paper: 2,605 cwts., compared with 1,730 cwts. The States exported to the English market more writing paper within the last six months, but there was a great decline in their supply of printing paper, 14,282 cwts., as against 16,672 cwts. Of course, it is only high-class and good quality paper that is exported to Canada. Newfoundland supplies show a decline, but this is due to the fact that the shipments under way were late in arriving.

* * *

The paper trade depression, of course, has affected the imports of ground wood, along with sulphite and sulphate, etc., as the following figures show for the period December 31 to June 30 (six months):—

	1913.	1913.	1914.	1914.
	Tons.	£	Tons.	£
Mechanical—				
Dry	4,057	18,531	2,118	10,130
Wet	250,714	573,558	230,368	512,969
Chemical—				
Bleached (dry)	10,732	113,239	6,794	77,408
Unbleached "	150,082	1,282,065	150,359	1,212,117
Wet	8,843	32,553	7,152	25,124

A large quantity of pulp has arrived from Newfoundland and Canada since the Trade Board issued the foregoing figures. The pulp usually arrives at Man-

chester and the Anglo-Newfoundland Development Company charter the steamers of the Donaldson Line. The six months' supply of ground wood (moist) from Canada was: 23,523 tons, compared with 26,623 tons in 1913. It is expected, however, that when the year's supplies come to be reckoned up the Dominion will easily beat her figures of 1913. Indeed, as I write they are already above the 1913 supplies, which shows that Canadian pulp is being more appreciated on the British market. The imports of June (for the month only) were as follows:—

	1913.	1913.	1914.	1914.
	Tons.	£	Tons.	£
Chemical pulps ...	43,972	353,770	40,788	319,559
Mechanical " ..	47,750	106,881	52,623	120,302

The supply from Canada increased by about 1,000 tons in June, most of which was ground wood.

* * *

The results of the various examinations held in connection with the English Technological schools, where instructions in paper and pulp manufacture are being given, will be announced this month. From all accounts the percentage of the pupils attendance has been good and, of course, when the students finish their final courses they enter the British paper industry as practical men, because mill experience is combined with the school work. The British Paper Makers' Association offer prizes annually to the students and give the movement their support. The Manchester Technical School, where there is complete mill equipment and powerful lights for examining and testing paper in various colors is to be extended. About \$97,000 is to be spent on the extension. The value of the services which the school is able to render is becoming increasingly recognized, and if it is to keep pace with the advancing needs of the engineering, chemical and paper industry, none of its departments will be allowed to become second rate. Many of the laboratories are equipped with several thousand dollars' worth of the latest and most up-to-date machinery, engines, etc.

SULPHITE WASTE LIQUOR.

It appears, according to W. Moeller, that sulphite liquor is wholly unsuited for tanning purposes. The liquor remaining in the soda process is better adapted for the purpose. It is explained that woodpulp liquor produced as a by product in the manufacture of cellulose by the soda process has quite different properties from that from the sulphite process. The liquor from the latter process contains much lime and sulphurous acid, which must be removed before it can be used as a tanning material; all woodpulp extracts produced in Germany are of this variety. Liquors from the soda process only require to be neutralized with a weak acid before use. All cellulose extracts have about 15 per cent of ash and this is included in the total soluble matter. They also contain quantities of non-tannins such as resin, sugar, etc., which must also be reckoned as useless when the cost is calculated. All these non-tannins remain in the liquors when cellulose extract is used mixed with other materials and accumulate in the suspender liquors to such an extent that they can only be run away. Molasses, can sugar and glucose are much cheaper to use for weighting leather than cellulose extract. Even when used as a weighting material only, scarcely 50 per cent of the total soluble matter of cellulose extract is utilized.

NEW PATENTS

WOOD-PULP THICKENER AND SAVE-ALL.

ALBERT D. WOOD, Canton, North Carolina, Inventor.
Patented July 14, 1914.

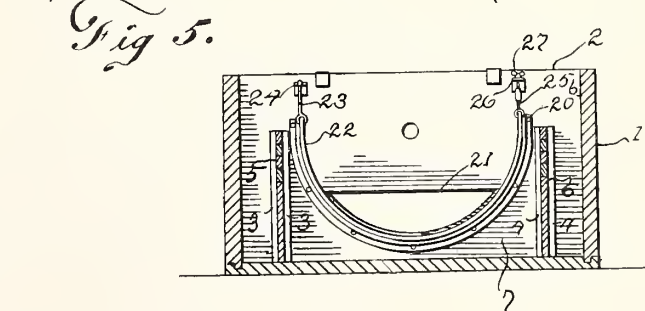
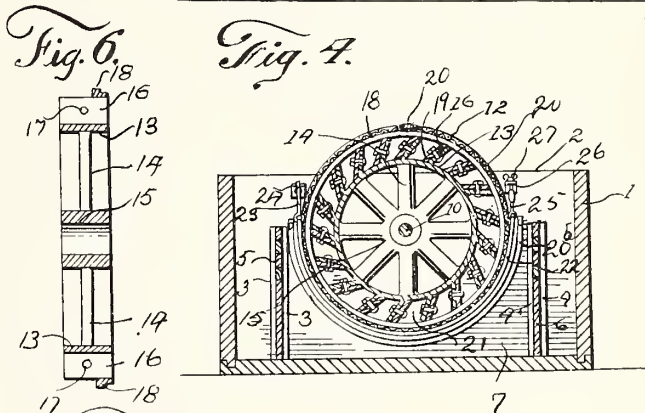
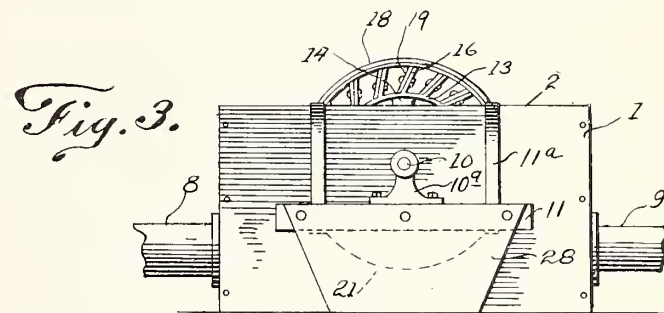
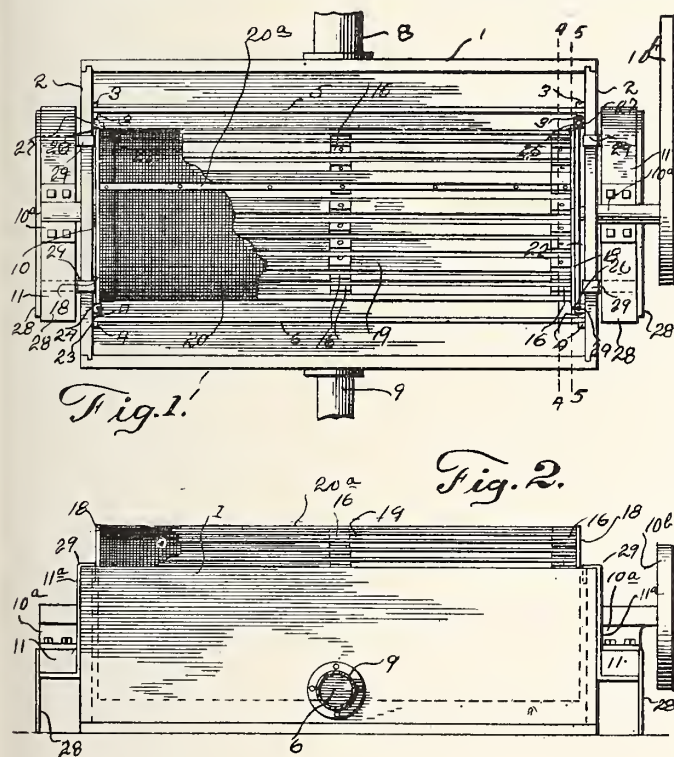
My invention relates to the manufacture of paper pulp, and has for its object the provision of a device for thickening the pulp, the device being serviceable also in the treatment of waste water, from pulp and paper mills, for the recovery of pulp fibre.

Heretofore in devices of this character, the paper pulp and water is directed into a vat having vertical partitions over which the pulp and water flows and mounted between the vertical partitions is a rotating cylinder having a surface of foraminous material, through which the water from the pulp is strained,

by pressing against the strainer surface and a portion of it flowing outwardly through the strainer surface, keeps it cleared of particles which ordinarily adhere thereto and obstruct the strainer.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of my improved pulp thickener and save all showing the strainer partly broken away; Fig. 2, a side view showing the strainer partly broken away; Fig. 3, an end view; Fig. 4, a cross



the water flowing out through the ends of the vat while the pulp passes on and flows over the other partitions and out of the vat. The disadvantage of this style of strainer has been that particles of pulp fibre, resinous matter and the like, would adhere to the surface of the strainer and eventually clog it, obstructing the passage of water through the strainer, thereby decreasing the efficiency of the strainer and making it necessary to clear the strainer by blowing it out with steam, cleaning with acids, scrubbing with brushes, or by other methods, requiring time and labor. The above treatment cleans the strainer in a very unsatisfactory manner, and is injurious to the facing or strainer surface.

In my invention the cylindrical strainer is provided with a plurality of inclined vanes forming pockets adjacent to the strainer surface that carry up some of the water that is strained from the pulp and this water

section on the plane indicated by the line 4—4 of Fig. 1; Fig. 5, a cross section on the plane indicated by the line 5—5 of Fig. 1; and Fig. 6, a cross section of one of the supporting wheels for the cylinder.

In the drawings similar reference characters will be used to designate corresponding parts throughout the several views.

1 indicates the vat having its ends 2 provided with vertical cleats 3—3 and 4—4 spaced apart in pairs adjacent to the two sides of the vat in which are removably mounted partition boards 5 and 6, said par-

titions 5 and 6 forming with the bottom of the vat a chamber 7 in which the wood pulp is strained.

8 indicates the inlet pipe connected with one side of the vat and 9 the outlet connected with the opposite side of the vat, it being understood that the water and pulp enter the vat 1 through the inlet pipe 8, flow over the partition 5 and into the chamber 7, and after being strained by the instrumentalities hereinafter described, the thickened pulp passes over the partition 6 and flows out through the outlet 9.

10 indicates a shaft journaled in journal boxes 10a mounted on beams 11 supported by means of brackets 11a engaging the upper margins of the ends 2 of the vat 1, said shaft 10 being actuated by means of a belt 10b connected with any suitable source of power or any other gearing may be substituted therefor.

A cylinder 12 is mounted upon the shaft 10 and consists of pulleys 13 keyed to said shaft and provided with the spokes 14 radiating from the hubs 15. 16 indicate vanes extending from the rims of the pulleys 13 and at an angle to the radius thereof, each of said vanes being provided with a eored opening 17. The cylinder as shown in the drawings is provided with three pulleys 13, one at each end and one intermediate of the ends, the pulley intermediate of the ends being as described above, while the pulleys forming the ends of the cylinder are each provided with a ring 18 secured to the other margins of the vanes 16 at the outer end of the cylinder.

19 indicate slats secured to the vanes 16 by means of bolts or other suitable fastenings inserted through the openings 17 heretofore described and through the openings 17 heretofore described and through suitable openings provided in said slats, said slats 19 extending throughout the length of the cylinder 12.

20 indicates a covering of wire gauze fabric mounted upon the slats 19 and having its overlapped edges secured by means of a strip of wood or other suitable material 20a, the nails or other securing means engaging said strip 20a being driven through said strip to the overlapped ends of the covering of fabric 20 and one of the slats 19 heretofore described.

In place of the wooden strip 20a, the ends of the wire gauze fabric 20 may be secured in any other suitable manner such as sewing or soldering the wire if desired and furthermore, in order to hold the fabric in place on the cylinder, several of the strips 20a may be secured around the cylinder on other slats 19 if desired, being preferably arranged at equal distances apart.

Secured to the inner side of each end 2 of the vat is a segmental flange 20b of angle iron that is spaced apart from the adjacent end of the cylinder 12 and each end of the vat is provided with a segmental opening 21 through which the water strained by the cylinder 12 flows from the vat.

To make the ends of the cylinder water-tight, I provide a packing strip of 22 of any suitable packing material such as a strip of felt secured at one of its ends by means of a bolt 23 mounted on a bracket 24 while its other end is likewise secured to a bolt 25 mounted on a bracket 26 and provided a wing nut or its equivalent 27 that is adapted to be used to tighten the packing strip 22 around the surface of the cylinder.

28 indicates a board secured to each of the beams 11 and arranged opposite the openings 21 in the ends of the vat that form spouts for the water flowing from said openings.

In operation, it will be understood that the pulp and water enters the vat 1 through the inlet pipe 8 and flows over the partition 5 into the chamber 7. The

water contained in the chamber 7 flows out through the meshes of the wire covering 20 of the cylinder and the openings 21 in the ends thereof, while the pulp passes on and upward over the partition 6 and out through the outlet pipe 9. It will be understood that during the rotation of the cylinder some of the water contained within the cylinder will be caught up by the slats 19 within the pockets formed thereby and the pulp on the outside of the cylinder and carried upwardly, and as the water flows through the strainer surface, some of the pulp will be deposited thereon and will be held to the strainer surface by the pressure of the liquid in the chamber 7 until on the rising side of the cylinder it reaches the level of the liquid in the chamber 7. Then the water which has been carried up in the pockets flows outwardly through the strainer surface freeing the mass adhering thereto which drops over the partition boards, the consistency of this mass being governed by the height of the partition boards which may be raised or lowered to deliver the pulp thick or thin as desired.

It will be understood that my improved thickener and save-all is adapted to be used for straining the water from the pulp after washing during the process of manufacturing the pulp, and is also adapted to be used to save any particles of pulp that may go out with the waste water from the pulp mill. My improved thickener is also adapted to be used to remove the water after bleaching process as well as after the process of screening the pulp, before its subsequent treatment by beating and refining for conversion into paper.

It will be also understood that my improved strainer may be used for other purposes than thickening wood pulp and saving particles of pulp and further as heretofore described, such for instance as filtering the water from sewage and also using as a preliminary filter for removing leaves, sticks, etc., from water in municipal filtration plants, and I do not therefore desire to be confined in the use of my invention to the manufacture of wood pulp as heretofore described.

RECLAIMING WASTE PRODUCTS IN THE MANUFACTURE OF SULPHITE FIBRE.

Hugh K. Moore and Robert B. Wolf, Berlin, N.H.,
Inventors, patented July 14, 1914.

In the manufacture of sulphite fibre in which the ground or chipped wood is treated with acid to dissolve the lignin and cementitious materials of the wood and free the cellulose fibre, it has generally been customary, after cooking operation to "blow" the digester, or discharge the contents thereof into a blow pit equipped with a "vomit stack" so called, which permits the escape of the vapor and gases. These vapors and gases compose free sulfur dioxide, water, wood alcohol, benzaldehyde, acetone, acetic acid and various by-products, all of which heretofore escaped into the atmosphere.

The object of the present invention is the reclamation of some of the waste products which have heretofore been discharged with the vapor of steam from the blow pit.

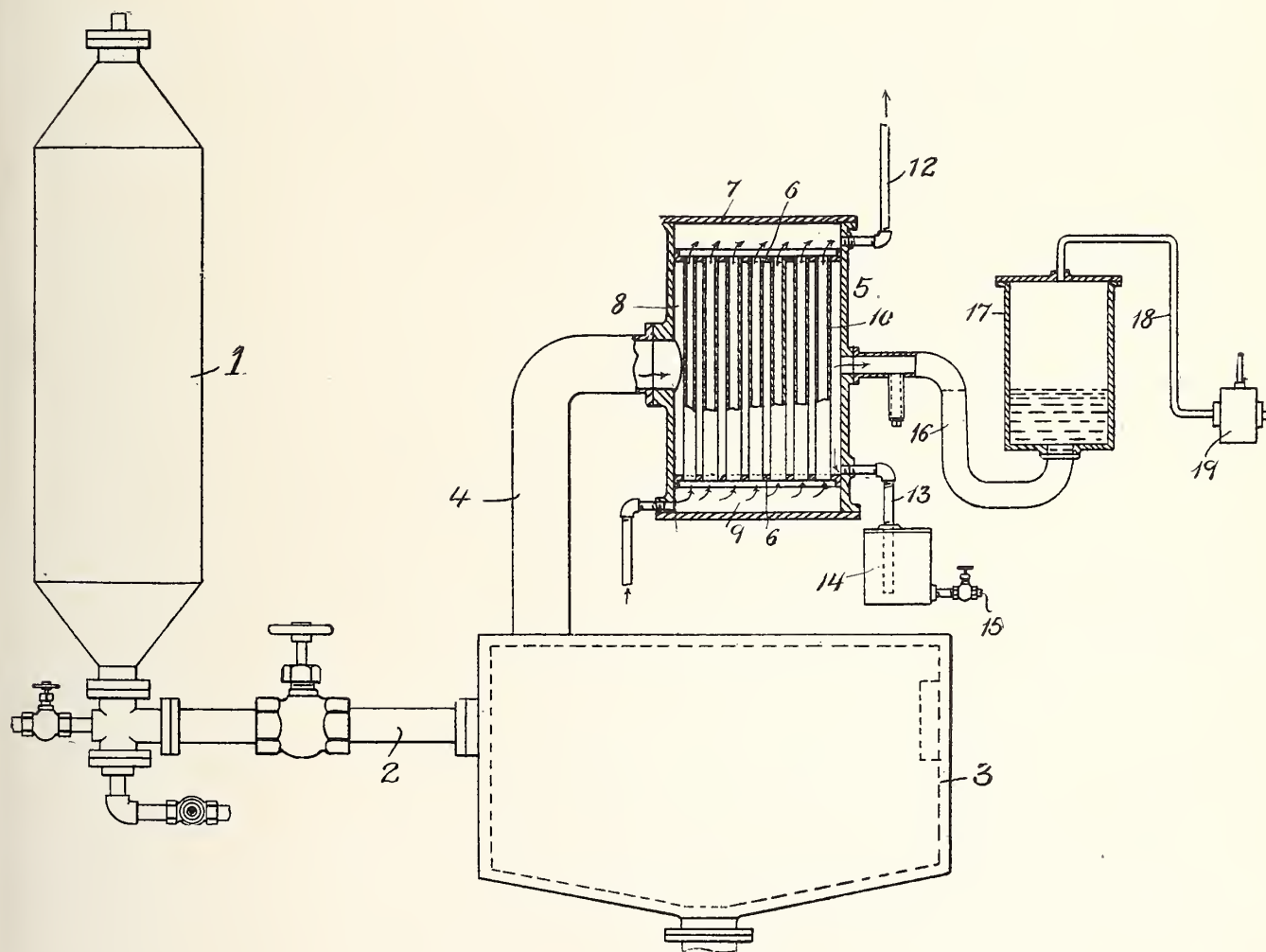
In carrying out our invention, we conduct the vapors arising from the pit into contact with a chilled solid body to condense the water vapor and those other vapors which will condense at slightly less than the boiling point of water and thereby to separate them from sulfur dioxide and such waste inert gases as may be discharged. The sulfur dioxide is then re-

covered in suitable form for reuse. The products of condensation are collected, and may be further treated for the recovery of valuable by-products therein contained. By withdrawing these products of condensation from the surface condenser at approximately the boiling point of water, the absorption thereby of sulfur dioxide is materially prevented.

On the accompanying drawing, we have illustrated certain of the instrumentalities which may be utilized in carrying out our process.

The digester is illustrated at 1 and is of the type used in the manufacture of sulphite fibre. In it are placed the chips and the acid, and, after the neck is sealed, steam is injected into the digester to bring

pit, at a steam pressure of say from 45 to 75 pounds per square inch (not including the pressure due to the static head), from 18,000 to 20,000 pounds of steam are liberated in the blow pit from the discharged water. The temperature of the contents of the digester varies from 250 deg. F. to 320 deg. F., and, as soon as the materials reach the blow pit, vapors arise therefrom and are conducted away through the vomit stack 4. Heretofore in actual practice these stacks have always opened into the atmosphere into which the rising vapors escape and become dissipated. In addition to the vapors, there has been heretofore an escape of a certain amount of free sulphur dioxide which was not utilized in the cooking operation. In accordance with



the contents thereof to the proper temperature. If desired, sulphur dioxide may be injected into the digester in accordance with the process described in our application Serial No. 451,246, filed February 1, 1910. After the wood has been cooked at the proper temperature for the proper length of time and the cellulose fibres have been freed from their cementing materials, the contents of the digester are blown in the usual way through the pipe 2 into a blow pit which is conventionally illustrated at 3, but which is constructed as ordinarily with the false bottom, not shown, for permitting the escape of the waste liquors. As usual, the interior of the blow pipe is at slightly less than atmospheric pressure. Hence when the contents of a digester of ordinary size are discharged into the blow

our process, the vomit stack is closed to the atmosphere and the vapors and gases are conducted to a surface condenser conventionally illustrated at 5. The surface condenser may be of any suitable or desired type. As illustrated, it is provided with diaphragms 6 6 forming compartments 7, 8, and 9, the compartments 7 and 9 communicating through tubes 10 passed through the chamber 8. As shown, the vomit stack discharges into the compartment 8 and the gases and vapors are caused to circulate around the tubes. Cold water or any other suitable cooling medium is introduced through a pipe 11 to the chamber 7, and, passing through the tubes to the chamber 9, is discharged through the circulating pipe 12. The vapors, entering the condenser from the vomit stack, are condensed

and pass therefrom by a pipe 13 to a receptacle 14 from which they may be drawn by the valved discharge pipe 15. Ordinarily we employ water for the cooling medium at its seasonable temperatures, although in lieu thereof a chilled cooling medium might be utilized, or the water itself might be cooled prior to its admission to the condenser.

The effect of condensation of the vapors is to reduce to liquid form the water vapor and such compounds as wood alcohol, benzaldehyde, acetone, acetic acid, and other vapors which would condense at, or slightly above the temperature of the cooling medium, the quantities, amounts and character of these compounds depend more or less upon methods, temperature, etc., used in cooking as well as the nature of materials cooked. The application of the principle of recovering these compounds by condensing vapors from blowing digesters, while herein described as applying to the sulphite process may also be applied to any other process such as the so called sulphate and soda process.

The condensation of the water vapor to water permits the absorption by the water of only a certain relatively small portion of the free sulphur dioxide gas which escapes with the vapor. The remaining large volume of SO_2 is conducted from the condenser by means of the trapped pipe 16, through a tank or receptacle 17 which contains a body of suitable absorbent such as sodium hydrate (NaOH), calcium hydrate ($\text{CaO} \cdot \text{H}_2\text{O}$), etc. To the upper end of the receptacle is connected an exhaust pipe 18 leading to a vacuum pump indicated at 19. The unabsorbed sulphur dioxide, leaving the condenser, is drawn by the vacuum apparatus into the absorber 16 where it is wholly absorbed by the sodium hydrate or other absorbent material.

The product of the condensation, which is collected in the tank 14 may be neutralized with calcium hydroxide $\text{Ca}(\text{OH})_2$. This has the effect of precipitating the SO_2 in the form of calcium sulphite (CaSO_3) which is removed by passing the materials through a filter press, leaving the filtrate practically clear and neutral. The filtrate contains acetic acid in the form of a lime or other salt, methyl alcohol, benzaldehyde, acetone and other organic acid salts and compounds which may be separated and removed by any of the well known processes. The absorbent in the tank 17, after it has absorbed to its full capacity the sulphur dioxide gas, may be used in making the bi-sulphite which is used in the digesters in cooking the wood.

In our previous application, hereinbefore identified, we have described a process of reclaiming the sulphur dioxide and other waste products discharged from the relief valves from the digester. The present invention provides for completely reclaiming the sulphur dioxide, which heretofore has been lost in the operation of blowing the digesters into the blow pits. In addition to reclaiming the sulphur dioxide, so that it may be again utilized, the present invention provides for reclaiming and utilizing valuable products such as methyl alcohol, benzaldehyde, acetone, acetic acid and other organic acids and compounds. It is desirable that the products of condensation should be as free as possible of sulphur dioxide.

We have stated herein that the vapors are condensed by a surface condenser or in other words that the vapors from the blow pit are condensed by bringing them into contact with a chilled solid surface. In this way the only water which can absorb the sulphur dioxide is that which has been condensed from the

steam which comes from the blow pit, and consequently this water may be brought out so near the boiling point that it contains the minimum amount of the gas. Consequently the greater volume of unconfined gas will not be absorbed by the water, but will pass into the absorber at 17. Furthermore by the employment of a surface condenser, the water, which is used as the cooling medium and which is delivered from the condenser in a clean heated condition, may be utilized for a variety of purposes for which it could not be used if it had been previously employed in the direct condensation of the vapors by contact therewith, because in the latter case it would have absorbed a portion of the sulphur dioxide. Preferably therefore the water of condensation is maintained at a temperature but slightly less than the boiling point so as to limit the absorption thereby of the free SO_2 .

It will be understood from the foregoing description, that the instrumentalities for carrying out the process are illustrated diagrammatically on the drawing, and no attempt has been made to show them in their relative proportions or to show them in detail, as their details of construction may be varied as circumstance and convenience dictate.

NOVA SCOTIA FOREST CONDITIONS.

Ottawa, Ont. July 25th.

According to Mr. James Lawler, Secretary of the Canadian Forestry Association, who has just returned to Ottawa from a month's lecturing tour in Nova Scotia, great interest is being shown in the Dominion Forestry Convention to be held in the City of Halifax, September 1 to 4. Mr. Lawler lectured in the cities and all the principal towns from Sydney to Yarmouth and found a growing interest in this subject which so greatly concerns Nova Scotians. While Nova Scotia has large interests in mining, fishing and fruit growing, it is being found that large quantities of timber are required to operate these industries. The pit props used annually in Nova Scotia coal mines would, if placed end to end, more than stretch across the Atlantic Ocean from Sydney to Liverpool. In the same way large quantities of timber are required to make fish barrels and apple boxes, and apple barrels, so that all parts of the community are beginning to see their need of timber. This local interest along with the interest of people in Canada, outside the Maritime Provinces and in the United States, betokens a large attendance and animated discussions at the Convention in September.

PULP BURNS.

Montreal, July 26th.

A large pile of pulp belonging to the Gres Falls Company (Union Bag Company) at Cap a la Madeleine, east of Three Rivers, Quebec, took fire on Monday night, July 20th, and since that time has been burning fiercely. Mr. McSweeney, of the pulp mill staff, late of the Union Bag forces in New York State, said that in all, some 11,000 tons would be consumed before the fire burnt out. At the present time the site of the pulp piles is covered with tangled masses of binding wires, and a few ashes. Efforts were made to quell the blaze, but it was found that despite the activities of the whole force during an entire day, during which the mill was shut down, the flames could not be subdued.

Fortunately the stock was insured, and there will be practically no loss.

PAPER STANDARDS AND PAPER TESTING

C. F. CROSS, London, in "Der Papier Fabrikant."

There have been several attempts to secure the adoption in this country of the system of testing, together with the standards of paper qualities defined in terms of the tests which we owe to the K. Materialprüfungssamt.

The late Dr. P. N. Evans translated (1890-92) the original publication of professor Herzberg's "Papier-Prüfung," and we have given prominent to these tests in our 'Text Book of Papermaking' in successive editions.

There has resulted a recognition of the value of this contribution to the technology of paper, but there is no general adoption of such standards as those formulated in this work.

We have been asked from time to time whether we could inform the technical public in England as to the moral effect of these standards on the industry in Germany; but we are quite unable to do this; many of our colleagues in Germany would no doubt be able to answer this question.

It has always appeared to us that on this question of moral effect, we had to reckon with the fact that these standards are rather standards for the buyer and consumer than the papermaker.

In this country there is always an objection to science, qua science, as applied to industry; a sort of prejudice which it is difficult to account for, and which flourishes in spite of the moral influence of our technical schools and teaching centres.

When we come to measure this prejudice, we find that it takes its strongest stand on the position that commercial valuation is impossible in terms of any physical or mechanical tests. In the case of paper it is an interesting question as to how far such methods can be justified to the practical man.

The most satisfactory short expression of results of such tests is a mathematical formula: just as in all matters of philosophy it is always more satisfactory to arrive at a poetical formula rather than a prose expression. The former, in addition to its value as a short expression, seems to carry with it some extra warrant of discovery.

While the value of such formulae is we admit, overestimated by many, it remains nevertheless an interesting problem for paper technologists to arrive at mathematical expressions: or, to go back to our first position, to arrive at an expression of paper values in the sense of their actual commercial or, sling values.

Our friend collaborator, Mr. J. F. Briggs, has given special attention to this matter, and in his present position as one of the technical directors of a paper mill of the highest standing and reputation, he is able to apply the science of the subject in the solution of routine technical and commercial problems.

Mr. Briggs has allowed us to read a communication in convention number 1914 from himself, on the subject of "Handle" of papers, and his conclusions fully confirm our view that there is no full measure of paper values in terms of breaking strain or breaking length, but that there is a second fundamental factor to be reckoned with, closely connected with bulk in the physical sense of specific volume. The judgement of

the expert paper buyer is a complex integration of conclusions from observations in these two main directions.

Mr. Briggs's long continued observations and experience lead him to an empirical formula in which he adds the factor derived from bulk, to the factor of value expressed in breaking strain (or breaking length) and he justifies his formula by illustrative examples drawn from actual mill experience.

It is satisfactory to see that this factor, for recognition of which we have long contended, is admitted: but we think it remains to find mathematical expressions nearer the actualities which may furnish clear mental pictures of the papermaker for the control of his paper-making operations.

We have on many previous occasions endeavored to show that the ingenious and otherwise useful expression "Breaking length" is often misleading and generally of no direct use to the papermaker in the technical control of his operations.

The physical actualities primarily involved in physical tests of paper are:

- (1) In Breaking strain: the sectional area.
- (2) in specific volume-weight, the specific density or concentration of fibre substance.

It is of practical importance to the paper-maker to keep in view the ratio of thickness of sheet to fibre density and we doubt whether the practical man could, without the help of simple mathematics, at once state the effect, say upon weight per square metre, of reducing each of these factors by 25 per cent.

Whereas if

$$W = c. t. s. \text{ and } w' = C \frac{3}{4} t \times \frac{3}{4} s = C \frac{9}{16} t \times s$$

the reduction is nearly 50 per cent. In the expression for Breaking Length

$$L = \frac{W}{b} \times \frac{1}{t s} \quad \left\{ \begin{array}{l} W = \text{breaking strain for} \\ \text{strip of width } b. \end{array} \right.$$

it appears that if t and s be made to vary inversely the value L which is a calculated value—remains unaffected. But in reference to the physical actualities how would the practical man proceed to make papers of constant Breaking Length under the condition of so varying s and t , that the product remains constant.

These are only taken as casual examples.

It appears to us that the papermaker has to concentrate on 1 and 2 as above; in regard to 1 he requires to bring his tests to unit of sectional area, and to maximum fibre density, that is, calculate his numbers on the assumption that the area broken consists entirely of fibre elements without air space.

In regard to 2: the second aspect of "efficiency and economy" in converting fibrous raw materials into paper is bulk, in the limited sense of volume.

It appears that these two variables must be treated jointly, and therefore when it comes to numbers, as a product. The final expression of efficiency and economy from the papermakers' point of view will be some function of this product which remains to be ascertained.

We do not pretend to follow these matters closely enough to offer more than the general suggestion:

but we have noted with interest the experience of a technologist, who like Mr. Briggs has to take these matters from a very different point of view from that which underlies any ordinary scheme of official tests.

It would be a matter of interest to compare his experience and conclusions with those of technologists working in others of the many sectional departments of papermaking.

NORTH EUROPEAN WOOD PRODUCTS.

The wisdom of Sweden and Finland are compared in a recent report in regard to the use of the waste of the respective local wood-working industries, much to the advantage of the former. It is shown that Sweden, for example, in 1911 produced from sawmill residue charcoal, Dutch black, resin, tar, wood-oil, wood spirit, turpentine, etc., to the value of nearly 20,500,000 marks, whilst 6,876 workpeople were engaged in burning coal, 100 in distilling wood, and 28 in making Dutch black. The value attributed to the foregoing refers only to what was produced in factories. In the year named the production of smithy coal as a home industry valued 30,000,000 marks. A large proportion of this coal is used in Sweden itself to take the place of the dear pit coal, the importation of which is falling off. In the opinion of competent people wood distillation deserves more attention at the hands of Finnish industrialists. With the aid of experienced chemists the industry should yield satisfactory profits, and the raw material is abundant, considering the number of stumps, branches, sawdust, etc., thrown away. In the cellulose factories the waste alkali is now run out as something of no value, whereas a fine spirit might be made from it. Every year in Finland millions of marks value in cellulose lye are run away, and thus a source of revenue is lost all through the industry's negligence in not keeping abreast of technical industrial progress.—*The Financier*.

CHARLES SUMNER, DECEASED.

The machine industry loses an old and esteemed member in Charles Sumner Barton, President and Treasurer of the Rice Barton and Foles Machine and Iron Company, who died at Worcester, Mass., on July 11th.

The large rag house of Samuel Kovinsky, of Chatham, Ont., was destroyed by fire recently. It is supposed that the blaze broke out owing to spontaneous combustion. The building, which was about 250 feet long by 30 wide, was filled at the time, and the loss is a heavy one.

In connection with the recent amalgamation of the Metropolitan Bank and the Bank of Nova Scotia it is interesting to note that S. J. Moore, is President of F. N. Burt Co., Limited, and the Pacific Burt Co., Toronto, manufacturers of sales books, paper boxes, etc., while Mr. Firstbrook is a member of the firm of Firstbrook Bros., box manufacturers, Toronto.

J. H. Brown, who runs a large plant at Marseilles, Ill., for waterproofing paper, was in London and other Ontario cities last week. He has patented a new waterproof paper, rain coat, which will retail at about a dollar, can be worn ten or twelve times before being discarded. Mr. Brown expects that there will be a big demand for the garment. He has also put several other novelties on the market in the way of waterproof paper specialties.

PAPER TRADE PRODUCTS OF THE BRITISH EMPIRE.

The special supplement of the Chamber of Commerce Journal, England states: The question of developing the manufacture of paper pulp from bamboos in India has been discussed in the Indian Forest Records by officials concerned in the utilization of the forest products of India, and a report designed to afford data for action on the part of capitalists has been issued. Information is provided as to a number of localities where large tracts of bamboos are available, the various species of bamboos found there, special advantages for the manufacture of pulp existing in each locality, suitable sites for factories, cost of transport, labour, etc. Five places in Lower Burma and six places on the west coast of Southern India have been selected as especially favorable. Success in the enterprise would seem to depend largely on satisfactory and cheap transport. Two notable factories have been established in the East for the pulping of bamboos, one in Formosa, and the other near Haiphong in Indo-China. The Chairman of the Industries Committee of the Pretoria (Transvaal) Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and reports from Scotland indicate that this grass is nearly equal to esparto for paper-making purposes. It is stated that a capital of £20,000 would be sufficient to run a mill capable of producing a minimum of 15 tons of packing and coarser kinds of paper per week. In advocating the starting of a paper factory at Pretoria, the Chairman points out that in addition to the grass, two of the principal articles necessary for the manufacture of paper, viz., lime and coal, are available in large quantities at a cheap rate.

A LONG CONTRACT FOR MECHANICAL WOOD PULP.

It is stated that Aktieselskabet Labros Trasliberi, the well-known Norwegian manufacturers of mechanical wood pulp, has sold its entire production to an English firm of paper-makers over a period of twenty-two years. Though the price has been based upon the present cost of manufacture, it appears that the Labro Company have the option of increasing or lowering the figure in accordance with the necessities of the market, but it is understood that the contract will be of the total value of between krs. 12,000,000 and krs. 15,000,000. The mill is now in course of enlargement, and when the extensions are completed will have a capacity of between 18,000 and 20,000 tons of wet pulp per annum.

PACKING PAPER OF INCREASED STRENGTH.

Although the highly developed paper industry is to-day in a position to make sufficiently strong packing papers for all purposes it is nevertheless frequently found that several layers of an insufficiently strong packing paper are employed for packing. This is an unnecessary additional expense which can be avoided by employing papers having an insertion of long fibres.

Such papers are made by cutting flax, hemp or even wool into suitably long parts and applying these fibres

to the web of paper which is being formed. Rotating brush-rollers will be used which remove the fibres from a storage receptacle and distribute the same across the paper-web. Generally there will be a second brush arranged behind the first one and having a higher speed for removing the fibres from the same. Sometimes two or more such additional rollers will be arranged. When several devices for applying the fibres are necessary the same are preferably arranged one over another, but when the wire is sufficiently long they may be arranged one behind another. If the fibres are to be embodied in the web principally in the longitudinal direction of the machine, the device for applying them will be arranged transversely of the wire, whilst if the fibres are to be located at right angles to the direction in which the paper runs the devices for applying them will be arranged at the two sides of the wire. Also, both arrangements may be used simultaneously. If a great many fibres are to be applied, instead of the brush-rollers roller having ribs or rotating ribbed discs will be used. In order to prevent the fibres flying out laterally and consequent loss, arresters will be arranged at the two sides of the wire at which the fibres slide down and are conveyed back by endless bands into the storage receptacle.

Papers having longitudinal threads are made by yarn being unwound from bobbins and pressed by means of press-rolls into the single or double paper-web. Threads running transversely are drawn crosswise over the paper-web by means of specially constructed swinging arms and are incorporated in the same.

HEAT REQUIREMENTS IN THE SULPHITE PROCESS.

In the sulphite process heat is used for mechanical and chemical processes. The quantity of power re-

quired for producing 100 kg. sulphite cellulose fluctuates of course according to the apparatus employed. There are plants in which the water supply requires 15 to 20 per cent of the entire consumption of power, whilst other plants use only little power for this purpose, because the water does not have to be lifted very high.

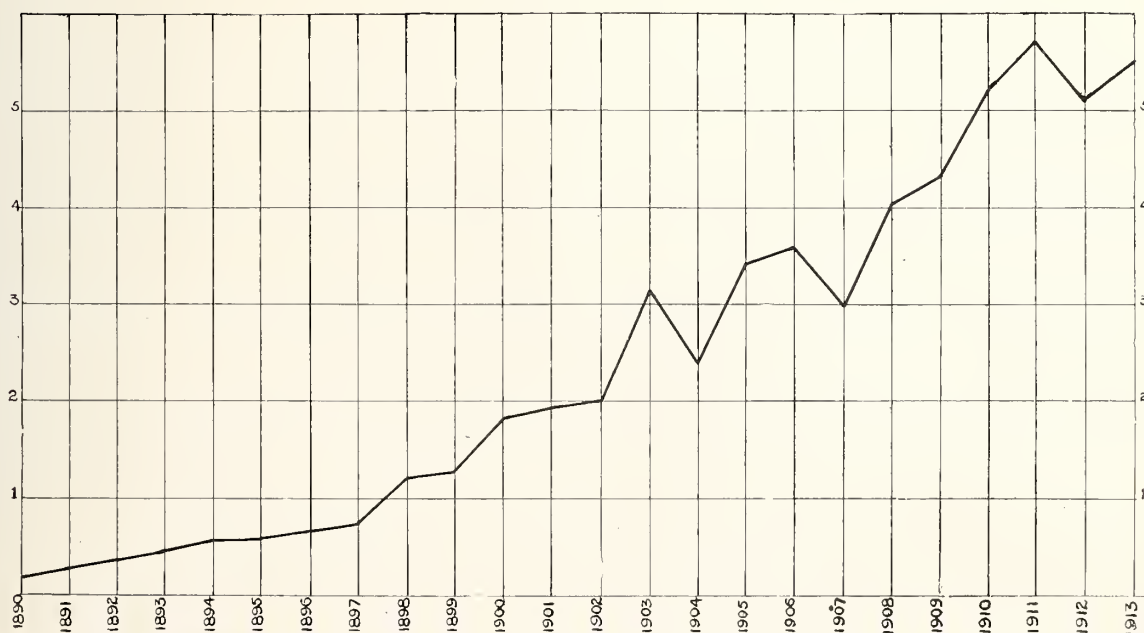
(1) Power required: On an average for 100 kg. unbleached sulphite cellulose 40 h.p. hours are required, for which 220 kg. steam equal to about 160,000 calories are necessary. A good steam engine using 4.2 kg. steam at 12 atmos. at + 300 deg. C. is assumed in this case. 10 per cent is reckoned as the loss for the effective horse-power and an additional 15 per cent for transmission.

(2) Cooking: For this 320 kg. steam = about 210,000 calories at 7atmos. pressure are used.

(3) Drying: For this 190 kg. steam = about 120,000 calories of 3 atmos. pressure are used. It is assumed that the cellulose arrives 35 per cent dry and at 15 deg. C. on the drying cylinder and is absolutely dry at 87 per cent.

For cooking and drying about 500 kg. steam, corresponding to about 330,000 calories are thus required per 100 kg. cellulose. This corresponds to a total consumption of 110 to 120 kg. coal per 100 kg. unbleached with 6¼-fold evaporation. When making 2,500 kg. cellulose per hour the total consumption of steam is about 18,000 kg. steam when direct steam is employed. When steam is taken from a turbine about 2,000 kg. steam per hour less will be used when making the same quantity of cellulose. These figures hold good for a turbine of 24.4 kg. steam consumption per kw. (17½ atmos. 300 deg. C. steam removed at 6½ atmos.) For large plants the consumption of steam increases correspondingly, of course, but the expenditure of power increases only slightly.—Der Papierfabrikant

Canadian Pulp and Paper Trade



Exports of Canadian Wood Pulp in Millions of Dollars, 1890-1913.

PULP AND PAPER NEWS

The town of Hearst, which is located 134 miles west of Cochrane and had a population of three or four hundred persons, was destroyed by forest fires a few days ago. The residents fought the flames for three days, but finally had to give in. All the buildings were wiped out except four. The frequency of bush fires in the northern part of the province has called attention for better protective measures in the timber limits, and it is probable that some action will be taken by the Ontario Government.

George Pauline, who for the last twenty-five years has been a caller to the Canadian trade, twice a year, representing Robert Fletcher and Son, paper makers, Manchester, England, has resigned. He expects to visit Canada in September next when he will represent special lines turned out by several old country mills.

N. E. Wainwright, who for some time has represented the National Paper Co., Limited, 156 John Street, Toronto, has resigned, and joined the selling staff of Ritchie and Ramsay, Toronto. He has been succeeded by E. G. R. Clarke, late of Montreal, where he was on the advertising staff of the MacLean Publishing Co. Mr. Clarke has entered upon his new duties.

O. W. Porritt, of Porritt and Spencer, Limited, paper makers, felts and jackets, England, was in Toronto and Montreal last week, calling upon the trade.

John Regnier, of Boston, representing the casein sales department of J. A. and W. Bird and Co., was in Toronto and other cities recently calling upon the paper trade.

Thomas Gain, the veteran paper man, who has been thirty-six years in the business and recently recovered from an attack of pneumonia, has returned to Toronto and resumed his duties as sales manager of the Don Valley Paper Co., after spending a few weeks in the Catskill Mountains, regaining his health.

George E. Challes of Toronto, representing the Rior-don Pulp and Paper Co., Montreal, has returned from an extended trip to the Middle and Western States. He reports that the demand for sulphite pulp is keeping up well, and that there is some improvement in the trade.

It is reported the George Irish Paper Co., of Buffalo, intend entering the Canadian field, and that they will establish warehouses in Toronto, Ottawa, Montreal, Hamilton, London and Winnipeg and carry stock at all these centres. Lou Honpt, President of the Company, was recently in several cities in Ontario on a business trip.

The Arnprior Felt Co., Limited, of Arnprior, Ont., has been granted a charter. The capital stock of the company is \$50,000 and the incorporators of the concern are James T. Griffith, Murtagh Sullivan, John Cunningham, George H. Moles, S. R. Rudd, N. L. McNaughton and Wallace A. Mackay, all of Arnprior. The company is empowered to construct, build and

operate felt and pulp mills, and to engage in the manufacture and sale of pulp-paper, felt and woollen goods or any product in which these materials are used.

Publishing and Printing Co. of Canada, Limited, has been granted a charter. The head offices of the company are in Montreal, and the capital stock is \$300,000. The concern is empowered to carry on business generally as printers, publishers, and engravers, as well as paper makers, envelope, paper bag and box makers. Among the incorporators are Leon Charlebois, E. T. Sayers, Felix Barriere, A. E. Balfry, and H. L. Moreau, all of Montreal.

An interesting suit has just been started at Osgoode Hall, Toronto, in which action is taken on behalf of Mrs. Isabella Taylor, widow of the late William T. Taylor, who seeks to upset the title of Robert Davies, President of the Don Valley Paper Co., Limited, Toronto, to the old Taylor brick works and paper mill property of 144 acres in the Don Valley. The claim is made on the ground that the land was acquired in 1901 at an unfair valuation, when E. R. C. Clarkson released it from an agreement made by Taylor Bros. for the benefit of their creditors. Davies gave \$332,000 for the Canadian Northern Railway right-of-way through the property, illustrating the marvellous increase in values in that locality just east of Toronto. In 1894 Taylor Bros. who owned the brick works and paper mill, mortgaged the property to Robert Davies, to secure \$75,363 and interest. It is stated that during the assignment proceedings, Mr. Davies valued the property in his proof claim at \$35,000. The creditors appointed Mr. Davies inspector of the estate, and he is said to have received from the assignee a deed of release of the land for a nominal consideration over the valuation of \$35,000. It is the striking difference between the \$35,000 for the 144 in 1901 and the \$332,000 for a narrow strip in 1911 that causes the suit. The appellants claim the right to redeem the land, and express doubt whether they or their creditors received fair play in the sale and distribution of their estate and effects.

Frankel Bros., proprietors of the Toronto Mill Stock and Metal Co., dealers in rags and waste paper, are erecting a large warehouse in Toronto on Broadview Avenue, Toronto, which, it is understood, will be leased for a term of years to a large wholesale house.

The new classification recently made by the American Felt Makers Association, which has gone into effect is causing some little trouble to Canadian dealers in rags and waste paper who have been exporting to United States mills. This is, however, being overcome as the provisions of the new classification are being understood.

Collett-Sproule, Limited, paper box manufacturers, 786 King Street West, Toronto, are removing their plant into their new and well-equipped factory on Portland Street, Toronto. The structure is a handsome one, built of concrete and brick consisting of four

storeys and basement. In dimensions the building is 50 by 100 feet, with white brick trimmings and an imposing front, and will more than double the present output of the company. It is understood that the factory cost in the neighborhood of fifty thousand dollars. It is splendidly lighted and provided with all modern conveniences in the way of elevators, shipping facilities and manufacturing conveniences.

C. F. Beyerl, who recently resigned as secretary of the Hammermill Paper Co., of Erie, Pa., and afterwards paid a visit to Montreal, Toronto, and other Canadian cities looking over the prospects of establishing a mill in Canada for the manufacture of writing paper, is at the head of a group which has organized a new company at Hamilton, Ohio, known as the Hamilton Paper Mills Co., which will take over the mill operated by the Sterling Paper Co., which make high grade light weight specialties including onion skin, catalogue and water leaf papers.

The largest waste paper warehouse in Canada has just been erected by E. Pullan on Maud Street, Toronto, near Adelaide Street. It consists of five storeys and basement, and is of brick, being of mill construction. Mr. Pullan moved into his new quarters this week. The building is 100 feet deep by 60 wide, and cost \$45,000. His former premises will be used for storing rags and the old rag house will be converted into a place for sterilizing and washing wiping rags, a complete outfit being put in. An automatic sprinkler system has been installed throughout the building, which has hard wood floors, metal sash, wired glass windows, and is well lighted.

Construction work on the new publishing house of the Methodist Book and Publishing House at the corner of Queen Street West and John Street, Toronto, is progressing rapidly. All the steel work has been completed and the walls are now being built. The premises, when completed, will be the largest possessed by any publishing concern in Canada. The handsome new business home of Hugh C. MacLean, Limited, publishers of trade papers, Toronto, which is located on Adelaide Street West, near Spadina Avenue, Toronto, is about finished, and will soon be ready for occupancy. The structure is five stories high with basement.

Charles C. Norris, President of Norris-Patterson, Limited, Advertising Agency, died on July 22, in Toronto. He had been in ill-health for the past three years. He was one of the early publicity men in Canada, being first connected with Toronto Saturday Night, later with the Toronto Globe, and then for eighteen years advertising manager of the Mail and Empire, from which he resigned to enter the agency business. He leaves a widow, one daughter and two sons.

A few days ago the Ontario Department of Lands, Forest and Mines awarded the right to cut red and white pine on three timber reserves in the Metagami district of the province. Last week tenders were awarded for cutting the red and white pine in the township of Blyth, which lies northwest of North Bay. The highest tender in each case was accepted, and where there was a tie, the berth was subdivided. The successful bidders were:—Berth No. 1, 12½ square miles, went to John R. Booth, Ottawa, the bonus being \$10.50 per 1,000 feet board measure, in addition to Crown

dues of \$2.00 per 1,000 feet and ground rent of \$10.00 a square mile. Berth No. 2, 12 square miles, went to J. R. Booth and George Gordon, who tied, the bonus being \$8 per 1,000 feet, with Crown dues and ground rent the same as before mentioned. As regards the third berth, J. B. Smith and Sons, Toronto, were successful, the bonus being \$10.26 per 1,000 feet, and Crown dues and ground rent as in the other cases.

The Bank of Commerce, Toronto, is the only Canadian bank which has a separate archives building. It is located on Atlantic Avenue, Toronto, and is a massive, four-storey brick structure. The system adopted by the Bank of Commerce is similar to that of the British and Canadian governments where all records that can be collected are gathered together in a central office and are arranged and indexed. In the building of the Bank of Commerce a special plant has been installed for the destruction of books and papers condemned to death. A William's shredder has been put up in the basement, which is driven by a forty-horse power motor, and the knives of the machine tear all the documents, which are fed into it, in shreds. The paper is drawn into a separate chamber and conveyed by a pipe to another section of the building, where it is baled in a press operated by electricity, and sold to paper manufacturers. The output has been contracted for for some time by the Provincial Paper Mills Co., Limited, and is used in the various plants of that company. Under the old system of destroying documents, paper manufacturers did that work under the supervision of bank officials.

It is understood that Duncan Chisholm representing the Chisholm Corporations, Limited, will erect a pulp and paper mill at Smooth Rock Falls on the Metagami River and that several engineers have been on the ground for some time examining the site and taking preliminary measurements under instructions of Louis Grey who was formerly connected with the Imperial Pulp and Paper Mills at Sturgeon Falls, Ont. The ground wood mill, which will be erected first, will have an output of seventy-five tons per day, and the paper mill about 150 tons of news print. Some three hundred hands will be employed, and the total outlay on the new projects will be close onto two million dollars. Some time ago Mr. Chisholm entered into an agreement with the Ontario government for the purchase of the pulp wood on the Metagami river pulp limit. He will pay the Crown dues of forty cents per cord for spruce and twenty cents per cord for other woods. The Crown has reserved a railway right-of-way, water powers, and granted lands.

J. L. Englehart, Chairman of the Timiskaming and Northern Ontario Railway Commission, has returned to Toronto from his monthly inspection of the line. He reports that the recent devastating fires in the north have all been extinguished and that the agricultural prosperity of the settlers is very promising. Not as much pulp wood is being taken out this season owing to the fact that the residents are devoting their attention more to seeding and harvesting operations. He said it was a fair deduction that the fires, which do exist below the line of the Transcontinental Railway, are due to the clearings of settlers who are taking advantage of the dry state prevailing to make extensive clearings by fire. This will allow a larger acreage to lie under the plough during the season of 1915.



The Markets

CANADIAN MARKETS.

The market for news print continues fair, although there has been a reported slackening of demand in the last couple of weeks, owing to the newspapers printing smaller editions during the summer as advertising patronage is generally at its lowest ebb in the months of July and August. Prices hold fairly firm. The book and writing mills are a little busier and report that several establishments are getting out catalogues which require supplies, while a number of concerns have held their annual meetings the printing of whose reports and statements always creates more inquiries for book and coated papers. Manila and fibres have been in rather poor demand, and jobbers are not as busy this month as they were during June. Stocks are, however, pretty low and many do not care to load up at the present time until they size up the outlook for fall trade. Roofing and building papers are not in very active requisition. Paper towels, napkins, toilet and tissue papers are enjoying good inquiry, owing to the holiday season and are commanding fair prices. The demand for ground wood pulp is quiet and few, if any, new contracts are being made at this season of the year. The sulphite situation keeps up well, and prices remain fairly firm. In the rag and paper stock line there is some activity in roofing material, but in mixed papers, thirds and blues, over-issues and other lines, there is a falling off in price. Some paper box factories report that business has livened up during the past few weeks, owing to the approach of the fruit canning period. On the whole the pulp and paper industry, regarded from every standpoint, is keeping up as well as could be expected, in view of the slack condition of affairs. It has not suffered to the same extent owing to the depression as many other lines of industrial and mercantile effort. The following prices prevail f.o.b. Toronto.

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.00 to \$2.10 at mill in carload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.50 to \$3.00.
 Manila, No. 2, \$2.75 to \$3.25.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$4.00 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$16.
 Ground wood, \$20 to \$23, delivered.

Sulphite (unbleached), \$40 to \$42, delivered in Canada.
 Sulphite (unbleached), \$42 to \$43, delivered in United States.

Sulphite (bleached), \$55 to \$56, delivered in Canada.
 Sulphite (bleached), \$56 to \$57, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 80c to 82½c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manila envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 35c.
 Over issues, 45c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinets, 75c to 77½c.
 Flock, 85c to 87½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
News quality, \$41 to \$42 per ton.
Bleached sulphite, \$54 to \$59 per ton.
Kraft pulp, \$3.60 to \$4.00.
Ground wood, No. 1, \$15 to \$16.
Ground wood, No. 2, \$22 to \$24, delivered United States.

UNITED STATES MARKETS.

New York, July 23rd, 1914.

There has been a fairly active demand for mechanically ground wood pulp during the interval, with considerable strengthening in price due to the low water season and also to the loss of a large pile of finished pulp by a recent fire. Practically the whole of the burned stock had been contracted for and was rapidly diminishing under a fair demand for shipments. The value of ground wood is now in the neighborhood of \$20 to \$24 a ton delivered, for fresh pulp and about \$17.50 to \$20 for No. 2 pulp. Numerous inquiries for small lots have been received in the local market.

Importers report a little firmer feeling in the chemical fibre markets during the interval. Stocks having been gradually reduced in storage quarters by a fairly steady movement of spot lots on request. The accumulation of pulp on this side resulted from misfortunes to certain paper manufacturers for whom good sized consignments of sulphite were en route. The inability of these buyers to accept the goods caused them to be put in storage at great expense to the importers. The open navigation season saw the arrival of large cargoes of sulphate and kraft pulp on steamers, which had been locked in foreign harbors during the winter.

These cargoes were promptly shipped to consumers having contracts and who had low stocks. Certain mills, which had been making offers for spot kraft were promptly satisfied at prevailing figures.

Movement in rags both foreign and domestic, has been chiefly confined to shipments on outstanding contracts and a few spot lots. Prices in old grades are weak. The past two weeks has reflected a fair demand for foreign new cuttings at 6c to 6¼c a pound.

Fairly heavy importations of old rags for the manufacture of medium and low grade papers have been made during the month. Probably none of the paper stock markets has been so weak as the bagging market. Considerable difficulty has been experienced by importers and dealers on account of moisture. Complaints by mill men are numerous. Rejections have been more or less heavy. There have been rather wide differences of opinion between the dealers and mill men. Some of these have only been settled by the most acute arbitration. One case was arbitrated for a sum of \$20 on an order aggregating more than \$3,000.

In old waste papers there has been a poor demand, and low prices on all grades except book stock have dominated. All grades of flat stock have moved with a fair amount of activity and prices have quite firmly held up. The poor demand for box boards and the weakening in values has led to considerable weakness of the lower grades. Very low prices and large accumulations in packing quarters are the leading characteristics.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$17.50 to \$20, delivered.
Unbleached Sulphite, dom., 1.90c to 2.00c delivered.
Unbleached Sulphite, impt., 1.82½ to 1.95c., ex dock, New York.
Bleached Sulphite, domestic, 2.75c to 2.90c., delivered.
Bleached Sulphite, impt., 2.55c to 2.65c., ex dock, New York.
Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.
Unbleached sulphate, imptd., 1.75c to 1.85c ex. dock New York.
Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

There has been some improvement in the tone of the paper market in general. Millmen and jobbers talk more optimistically and report a fairly healthy tone to the situation here. Mills have been running on pretty good time for this season of the year. Fairly good-sized orders have kept the mills pretty busy, while the numerous small orders which create the feeling of a lot of business, have been rather sparse. Jobbers have allowed their stocks to deteriorate in the case of small lots, for those have been rather few in number. Newspapers have taken their normal consumption of paper. Transient orders have been fairly good at prevailing values. The demand for wrapping papers has been quiet, and prices rather weak. Keen competition among mills in this grade has been a leading characteristic. The contracts for fall delivery to publishers for book papers are being made, and the price is improving in this grade. Mills have been fairly busy ledgers are in fair demand, especially in the medium grades. Kraft papers are in fair demand under demoralized conditions of price. Box boards of all kinds are in poor demand. There has been some improvement in the demand for paper bags. The tissue market reflected a quiet tone in the interval, but it is rumored in the trade that there will be some sharp advances in prices, which is anticipated in the next few weeks.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, side runs, 1.95c to 2.05c.
News, sheet, \$2.20 to \$2.30 f.o.b. New York.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, \$2.40 to \$3.00, delivered.
Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
Kraft, No. 2, \$3.00 to \$3.35 f.o.b. New York.
Boxboards, news, \$28 to \$30 per ton, delivered.

Boxboards, straw, \$26 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42½c f.o.b. New York.
 Tissue, fourdrinier, 47½c to 50c f.o.b. New York.
 Tissue, jute Manila, 40c to 41½c f.o.b. New York.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine.)

London, July 20, 1914.

The British paper industry is in a moribund condition, and were it not for a fair demand on domestic account, many of the mills would be in a helpless state. The depression in trade is general, but the paper trade is now suffering from its dullness since September of last year, and naturally, large stocks of paper are on hand. The six months' trade since the first of January last shows a decrease 71,668 tons of paper, boards, writing and printing paper, envelopes, etc., when compared with the same period in 1913. All the British colonies are taking smaller supplies, and this is a serious matter because they are the best markets for the mills of the United Kingdom. At some of the mills the help has been cut down to a minimum. Economy is the dominating feature of all manufacturers, and competition and price-cutting are keen in the home markets. In the London and provincial printing and publishing houses a fair amount of newsprint and writing and printing papers of a good quality are finding a consuming channel. Packing and wrapping papers have also improved in demand, but all other classes of papers and boards are changing hands very slowly. Nearly all the manufacturers are complaining of the bad state of business, and so are the paper agents and merchants. In Germany and Scandinavia the same story is to be heard everywhere one goes.

Ground Wood.

Moist ground wood is changing hands in some instances at a fraction over the cost of production, and naturally the English wood pulp importers are alarmed. Fortunately, business transactions of this character are confined to a small and very limited circle of sellers. Enquiries are being made for next year's contracts and for contracts further ahead. Business to-day is confined to small spot parcels, but buyers are holding aloof until sellers come down a further notch before they close future terms. In Norway and Sweden business is very dull. Large supplies are arriving in England from Newfoundland and Canada.

Prices are now about as follows, c.i.f. British ports:
 Pine, 50 per cent, unwrapped (prompt), \$9.48 to \$9.60.

Pine, dry (prompt), \$19.20 to \$22.

For forward delivery charge about half a dollar extra.

Chemical Wood Pulps.

There is light revival in the demand for sulphite, but buyers are mostly interesting themselves in contracts for 1915 and longer. Owing to the depressed condition of the paper industry buyers are very careful, and will do practically very little in prompt or spot parcels. Soda pulps are on a lower basis as regards prices and the stocks on producers' hands appear to be plentiful. Kraft pulp shows little change. Looking at the position generally, buyers are hoping for further concessions. In Scandinavia new business is scarce and attention is riveted on deliveries against current

contracts. Prices are about as follows, c.i.f. British ports:—

Bleached Sulphite (No. 1), \$55.80 to \$60.
 Easy bleaching sulphite, \$40.20 to \$41.40.
 Sulphite news, \$36.00 to \$37.80.
 Unbleached soda, \$36.50 to \$36.00.
 Soda kraft, \$31.80 to \$33.60.

Rags and Chemicals.

Stocks of rags are heavy, indeed, dealers report that they are heavier than usual on account of the slackness at the mills. Prices, however, are unchanged, although some of the low grades may be had on a lower basis. The chemical trade, in common with other industries, is feeling the depression of business, but values are practically unchanged. Caustic soda is \$48 for 76 per cent and 60 cents extra for 77 per cent. Salt cake is \$9.90 per ton; soda crystals are up to \$10.20 per ton; sulphur \$24 per ton; Alum \$28.80 to \$29 per ton for lump and \$33.60 for the ground. Bleaching powder is \$26.40 and upwards for softwood. Ammonia alkali, which is in good demand is \$10.20 to \$10.40 for 58 per cent. Esparto is still scarce and dear.

Fillings.

Contracts for China clay are being completed, and prices are about the same as this year's. Gypsum, mineral white, pearl hardening and other fillings and loadings are quiet and unchanged in values.

EXPORTS TO AUSTRALIA LESS.

The report of the Canadian Trade Commissioner to Australia (Mr. D. N. Ross) for the year 1913, shows an active falling-off in the exports of Canadian paper to the sister colony. The figures for 1913 are as follows:—Printing paper £149,050; paper hangings, £1,421; all other, £4,298; stationery, £905.

Since 1908 there has been an irregular decrease in printing paper exports. In that year this commodity formed the largest single item in the export trade, but to-day it stands below both agricultural implements and motor cars:—

Year.	
1908	£189,791
1909	136,099
1910	158,624
1911	133,203
1912	179,173
1913	149,500

NEW CONVEYOR.

At the Laurentide Mill, Grand Mere, the big new steel pulp conveyor, designed for a mill capacity of 500 cords per day, started up at 6 p.m. on June the 24th. The conveyor is more than 1,200 ft. long with 2 steel towers of 187 ft. height and one shorter while the conveyor itself is 120 ft. above the ground at the foot of the towers.

FIRES OUT.

Complete reports received by the Ontario Department of Lands, Forests and Mines from the fire rangers in the North say that no forest fires are now burning. Heavy rains have recently contributed to their extinguishment. There are between five and six hundred rangers employed by the Government, besides those in the services of timber licensees and the various railways.

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CONSERVING TIMBER IN ALGONQUIN PARK.

The Ontario government some few years ago entered upon a policy of conserving the timber resources of the province, and naturally their eyes were turned in the direction of Algonquin Park to see what could be done to bring back into the Crown free from any private control by timber license or otherwise certain areas which had been cut over or partly cut over.

In pursuance of this idea the Crown purchased from the Munn Lumber Company its rights to licensed territory covering 350 square miles almost entirely within the park, for which the sum of \$290,000 was paid. At the time the park was set apart originally, nothing had much value except the pine, as the region was remote from railway connection, hardwoods were not flodable, and hemlock and spruce were not in demand, so that pine was really the only timber of value. Since then railways have pierced the park and all timber has taken on a considerable value, and there is every prospect that all varieties of timber in the park will greatly appreciate in value in the future. There are large quantities of birch, hemlock, spruce and balsam, which are valuable woods not only for lumbering, but for chemical purposes, and there is a chemical plant in process of erection near the park which will no doubt reach out for supplies of timber wherever they can find it available or purchasable, and if an operation of this kind gets a footing in the park, the ground covered by its cutting will be swept clean.

It was considered a good move to purchase the Munn Lumber Company's limits, because devastation was threatened by their cutting of all kinds of timber down to a very small diameter, to have permitted

which would have destroyed the park, and it might as well have been abandoned.

Mr. Aubrey White, deputy minister of lands and forests, expresses in his report the opinion that every effort should be made to preserve the timber in the park by quieting all lumber titles where they can be purchased at a reasonable price, for in another generation not only will the timber so preserved have increased enormously in quantity, but also in value, and with proper protection, and regulations as to cutting, a large revenue and a considerable supply of timber for provincial needs will be available. It would be an act of vandalism to allow this magnificent park to become a total waste, as it infallibly would if all the timbers were permitted to be cut for even the next 15 years. The park should be extended. There are several localities outside it that ought to be brought in, notably on the east, because these territories are unsuitable for settlement. Settlement should not be allowed in them, and the territories should be brought into the park free of licenses if they can be obtained on equitable value.

There are some licensees who have expressed their willingness to sell at what they call reasonable prices—the Hawkesbury Lumber Company, Messrs. Gillies Brothers, and the Pembroke Lumber Company.

Fire broke out in the slasher house at the top of the incline bringing lumber from the mill to the sorting table, at 1.30 a.m., on Sunday, June the 28th, and threatened one of the cableway towers used in work on the new dam, the sulphur house and a nearby pulp shed. Employees, however, quickly put it under control so that the loss was slight and that entirely covered by insurance. Since then, an addition to the threatened shed has been completed.

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RECORD YEAR IN TIMBER PRESERVATION.

The most notable progressive yet recorded in the chemical treatment of timber to prevent decay was made in 1913, according to a report recently issued by the American Wood Preservers' Association in co-operation with the forest service of the Department of Agriculture.

The report states that 93 wood-preserving plants in 1913 consumed over 108,000,000 gallons of creosote oil, 26,000,000 pounds of dry zinc chloride and nearly 4,000,000 gallons of other liquid preservatives. With these the plants treated over 153,000,000 cubic feet of timber, or about 23 per cent. more than in 1912. The output from additional plants unrecorded would increase the totals given.

Impregnation of wood with oils and chemicals to increase its resistance to decay and insect attack, the report goes on to say, is an industry which has become important in the United States only in recent years. In Great Britain and most of the European countries practically every wooden cross-tie and telephone or telegraph pole receives preservative treatment. In the United States less than 30 per cent. of the 135,000,000 cross-ties annually consumed are treated, and the proper treatment of an annual consumption of 4,000,000 poles may be said to have scarcely commenced.

Real progress in the United States dates from 1852, when the Kyanizing process, using bichlorides of mercury, was developed. In 1837 two other processes were introduced, the Burnett process using coal tar creosote. These last processes are very largely in use today.

The idea of timber preservation at first made very slow growth in this country, on account of the large supply of cheap and durable timbers and the general disregard shown toward economy in the use of natural resources. In 1885 there were only three pressure plants in the United States; and in 1895 only 15. Since then, however, the industry has grown rapidly; in 1913 there were 117 plants.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on WEDNESDAY, August 5th, 1914, at 10 o'clock A.M., the Timber Limits herein-after mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

License No.		Sq. Miles
181	River St. Jean Br. East No. 1	22
182	River St. Jean N.E. Branch No. 2	18
183	River St. Jean East Branch No. 3	20
184	River St. Jean, No. 7	12
185	River St. Jean, No. 8	12
186	River Saumon & Tribut River St. Jean	34
187	River Magpie, No. 3	32
188	River Magpie, No. 4	32
189	River Magpie, No. 5	32
190	River Magpie, No. 6	32
191	River Magpie, No. 7	32
192	River Magpie, No. 8	32
193	River St. Jean, No. 1	24
193	River St. Jean, No. 2	24
194	River St. Jean, No. 3	23
195	River St. Jean, No. 4	18
196	River St. Jean, No. 5	20
197	River St. Jean, No. 6	20
198	River Magpie, No. 1	32
199	River Chambers, No. 1	56

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

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HOW TO DISSOLVE ALUM.

In many mills the alum is weighed and dried, and is thus added undissolved to the pulp. This process is simple, but incorrect, says the Papier-Fabrikant, especially as the weighing is frequently omitted. In this process variations in the admixture of alum can scarcely be avoided, and the necessary consequence is irregularity in the sizing. Consequently rosin size is frequently unjustly blamed. If it is wished to add the alum undissolved it should always be weighed and previously pulverised.

For all better quality papers the alum should certainly be dissolved. Two dissolving vessels should be used, the alum for use being taken from the one whilst the alum is dissolved in the other. The vessels are preferably made of wood or lead-covered metal, and provided with a double bottom, which is fixed near the top edge of the vessel, and provided with holes about 20 mm. in diameter. Always put the same quantity of alum on to this double bottom, which consists of wood or lead, and is dissolved exceedingly rapidly in the filled vessel. Iron vessels, even those of reinforced concrete, are not to be recommended, as they are destroyed in a short time. Frequently ordinary rosin-size casks suffice, one of which is so placed over each beater that the alum can run out directly into the beater. Also the alum may be wrapped up in clean cloths and suspended in the casks. The pipes and cocks must be of lead. The alum solution should be filtered, if possible, before being used.

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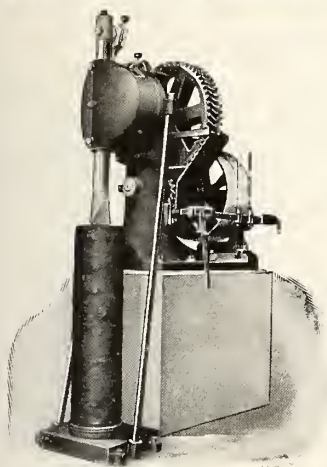
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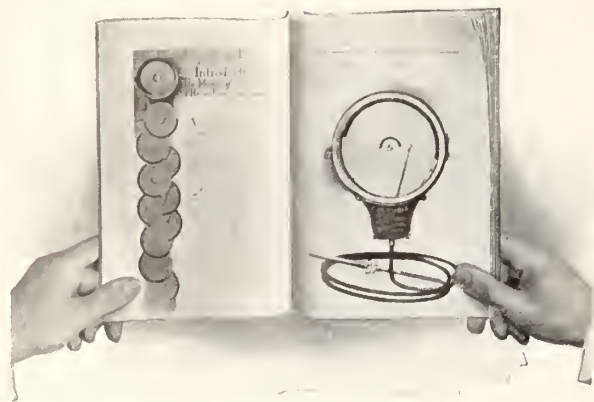
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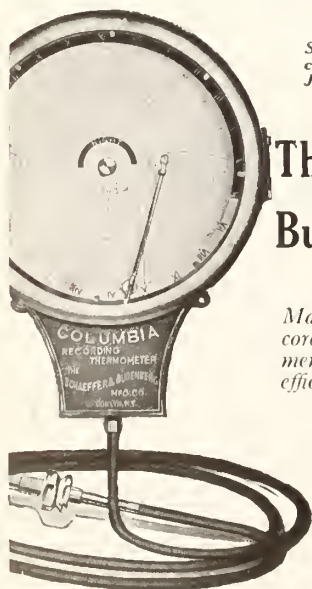
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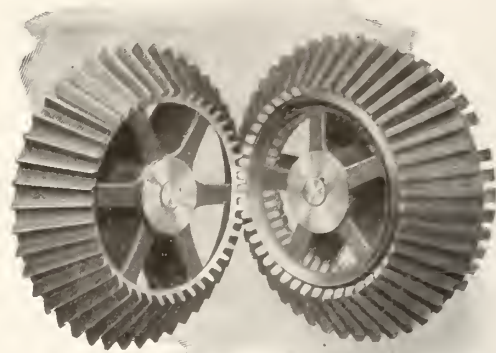
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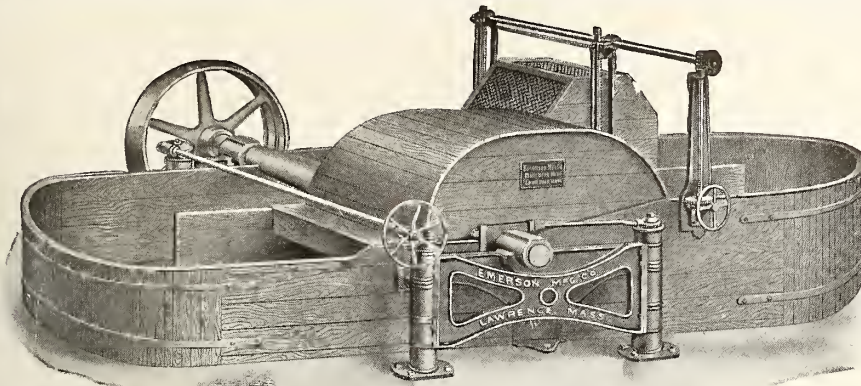
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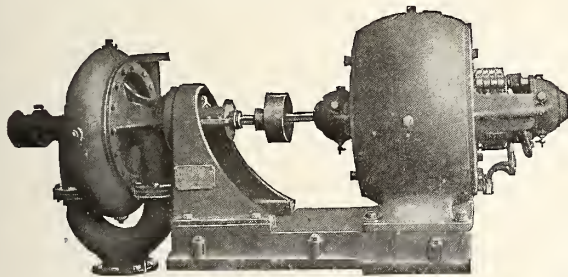
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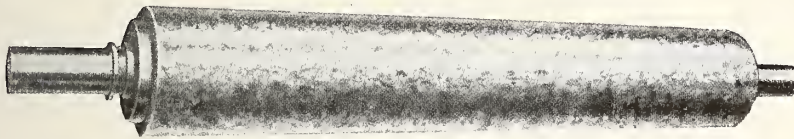
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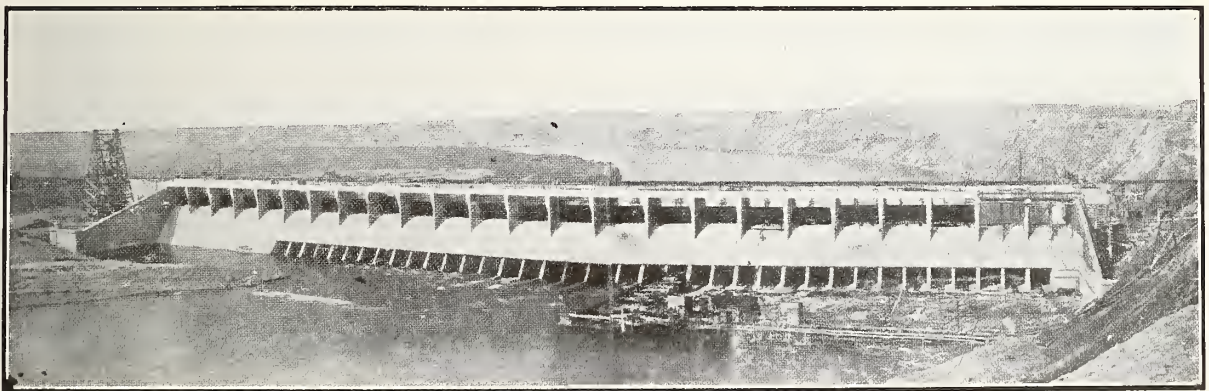
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BROWN**

Shades promptly matched in our Laboratory

INDEX TO MILL SUPPLIES

This Directory is published to facilitate the work of our readers, in the mills. If the information sought is not found, an invitation is extended to communicate with the editor, who will gladly be of all assistance possible.

- Air Compressors**
Blethen, Hugh R., New York
- Air Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkers**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
- Belting**
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Reddaway, F. & Co., Montreal, Can.
- Belting "Camel Hair"**
Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Blowers**
Sherbrooke Mach. Co., Sherbrooke, Que.
- Boilers**
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Fourdrinier Wires**
Capital Wire Cloth and Mfg. Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calendar Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticizing Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chip Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach Co., Hamilton, Ont.
- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg. Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach Co. Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Martaweller, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
- Digester Lining**
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Digester Gauges**
Schaeffer & Bodenber, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Engineers Ltd., Montreal, Can.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Felts**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurttemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

- Heating**
Sheldons, Ltd., Galt, Ont.
- Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.
- Knives**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.
- Kollergangs**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Laying Machines**
Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.
- Motor**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.
- Presses**
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.
- Paper and Pulp Machinery**
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Parrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales, Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurttemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England
- Pneumatic Thickeners**
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England
- Pumps**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.
- Rags**
Walker, J. R. & Co., Montreal, Can.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Rollers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-A-ills**
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Tanks**
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
- Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Transmission Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
- Traveling Cranes**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Trelleys**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M. Co., Inc. New York, N.Y.
 Voith, J. M., Wurttemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Hamilton, Wm. Co., Ltd., Peterboro, Can.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
 Christie, Geo., Ltd., Glasgow, Scotland.
 Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
 Tippet, Arthur P. & Co., Montreal, Can.

Taylor, J. A., Montreal, Can.
 United Wire Works, Ltd., Edinburgh, Scotland.
 Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm. Co., Peterboro, Can.
 Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Machinery Co., Sherbrooke, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Basin Electric Light & Power Co., Ltd., Montmagny, Que.
 Beaver Co. Ltd., Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
 Booth, J. R. Ottawa, Ont.
 Bronson Co., Ltd., Ottawa, Ont.
 Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
 Colonial Wood Products Co., Ltd., Thorold, Ont.
 Campbell Lumber Co., Weymouth, N.S.
 Canada Paper Co., Ltd., Montreal, Que.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Compagnie de Pulpe de Dalmas, Dalmas, Que.
 Davy, James, Thorold, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
 Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
 Ford, J. & Co., Port Neuf, Que.
 Jacques-Cartier Pulp & Paper Co., Montreal.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 La Cie de Metabetchouan, St. Andre, Que.
 La Havre Pulp Co., Ltd., Bridgewater, N.S.
 Lake Megantic Pulp Co., Lake Megantic, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 MacLaren Co., Ltd., The James, Buckingham, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
 North Shore Power, Railway & Navigation Co., Clarke City.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
 Ontario Paper Company, Thorold, Ont.
 Ouatchouan Falls Paper Co., Ouatchouan Falls, Que.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Price-Porritt Pulp & Paper Co., Rimouski, Que.
 Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
 River-du-Loup Pulp Co., Ltd., Fraserville, Que.

Soucy, F. Florentine, Old Lake Road, Que.
 Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 St. George Pulp and Paper Co., St. George, N.B.
 Thorold Pulp Co., Ltd., Thorold, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Union Bag & Paper Co., Cape Madeleine, Que.
 Trent Valley Paper Mills, Glenmillier, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
 Dryden Timber and Power Co., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Quebec and St. Maurice Industrial Co., La Tuque, Que.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Booth, J. R., Ottawa, Ont.
 Dominion Pulp Co., Ltd., Chatham, N.B.
 Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordan Pulp & Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
 Lincoln Paper Mills Co., Ltd., Merriton, Ont.
 Ford, J. & Co., Port Neuf.
 Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
 Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
 Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond, "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
 Eddy Co., The E. B., Ltd., Hull, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Spe

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa.

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Montreal.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

ibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New-
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Miller Bros. Co., Ltd., Glenmiller, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenosami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B. Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal, Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," "Hercules Manilla," "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Crendon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 73 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

MILLWRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required. Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

WANTED—Experienced man for operating sheet cutter. Preference given to a man speaking both French and English. Belgo Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, P.Q.

MILL MANAGER—Wants position. Twenty-five years' experience on news, manilla, hanging in the largest and best mills in the United States. Best of references. Address manager, c.o., Pulp and Paper Magazine, Montreal.

SUPERINTENDENT of experience wants position in mill making news, book, hanging, Manilla or specialties. Good on color and have good mechanical ability. References furnished.—S. W. K., Pulp and Paper Magazine, Montreal.

FOR SALE—A one-machine mill, doing good business, in first class running order, close to Toronto. Box 381, Pulp and Paper Magazine, Montreal.

FOREMAN MACHINIST.—Thirteen years' all-round experience in construction and repairs, specialised on paper mill repairs for six years, five years' foremanship, desires similar position. Box 87, Pulp and Paper Magazine, Montreal.

CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

WANTED—Four first-class Wet Machine and Grinder Foremen for new 200-ton Mill; state fully ages and salary required. Apply Box No. 86, Pulp & Paper Magazine, Montreal.

TECHNICALLY EDUCATED MAN, age 30; single; T.T.; holding highest diplomas given in England in papermaking; has taken advanced course in pulp and paper chemistry, six years' training under British expert in Kraft and pulp; experience in Britain, Norway and Finland; highest references; desires position as manager or assistant manager of Canadian mill, preferably after three months' time. Address "Canada," c-o Pulp and Paper Magazine.

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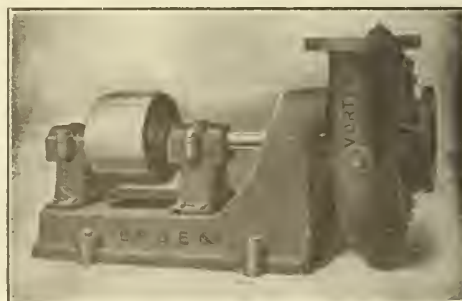
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AYERS LIMITED
Lachute Mills
P.Q.

Established
1870

FELTS

For
Pulp and
Paper Mills



**LAWRENCE
PUMP &
ENGINE CO.**

P.O. Box 70,
Dept. 10

**LAWRENCE
MASS.**

**CENTRIFUGAL
PUMPS**

We make an
exclusive
specialty of
High Effi-
ciency Centri-

fugal Pumps for Paper and Pulp Mill. In one mill 49 of our Pumps are running, the customer writes—"Your Pumps are all giving perfect satisfaction."

Telephone 1700 Broad
1701

Cable Address: "LAGERLOF NEW YORK"

Scandinavian-American Trading Company

PRODUCE EXCHANGE BUILDING - NEW YORK

IMPORTERS AND EXPORTERS OF

FOREIGN AND DOMESTIC

WOOD PULP

OF ALL KINDS AND

PAPER MILL SUPPLIES

HANS LAGERLÖF, PRES.

The HARMON INCLINE SCREENING SYSTEM

Will give greatest capacity
Will give cleaner stock
Will save power
Will save labor
Will not require use of Rakers

Write us for full descriptive Catalogue and
testimonials from the best mills in the
country.

Harmon Machine Company
Watertown, N.Y., U.S.A.

Glens Falls Machine Works

GLENS FALLS - NEW YORK

Sole Manufacturers of

The ROGERS WET MACHINE
for Chemical Pulp

**TROMBLEE & PAULL ROTARY
SULPHUR BURNERS**

The MOORE ROTARY SCREEN
for Ground Wood Pulp

Improved STANDARD GRINDERS

Improved WET MACHINES

ROTARY PUMPS, Etc.

Write for Particulars and Specifications
They will interest you

F. N. McCrea, President
W. N. Munroe, Treasurer
J. A. Bothwell, Gen. Manager

EDWIN P. LINDSAY

Selling Agent

299 Congress Street,
Boston, Mass.

Brompton Pulp and Paper Company

Daily Production :—
320 Tons Ground Wood Pulp (Dry)
90 Tons Sulphate Pulp (Dry)
60 Tons Kraft Paper

LUMBER of all kinds:—
Clapboards, Shingles and
Pulpwood

MILLS AT
EAST ANGUS,
BROMPTONVILLE
and D'ISRAELI, P.Q.

Manufacturers of PAPER, PULP, LUMBER

Kraft and Fibre, Sulphate and Ground Wood, Clapboards, Shingles, etc., of every description in first quality.

TRADE



MARK

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NATIONAL PAPER COMPANY *Limited*

Head Office and
Eastern
Warehouse:
READ BLDG.
MONTREAL
P.Q.

Manufacturers of
HIGH GRADE COATED
BOOK, LITHO and LABEL
PAPERS, also DULL FINISH
BOOK and BOXBOARD

MILLS
AT
VALLEYFIELD
P.Q.

Toronto Warehouse:
156-160 John Street
Toronto

Western Representatives:

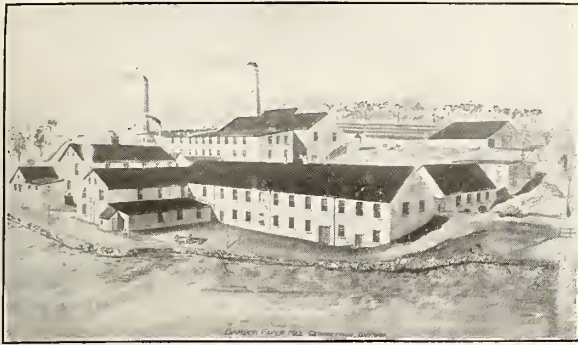
TEES & PERSSE, LTD.

Winnipeg, Fort William, Regina,
Moose Jaw, and Saskatoon

TEES & PERSSE

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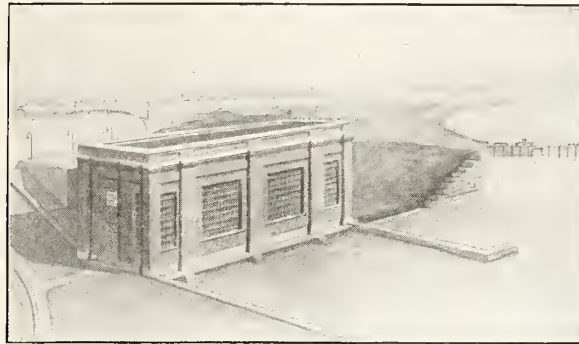
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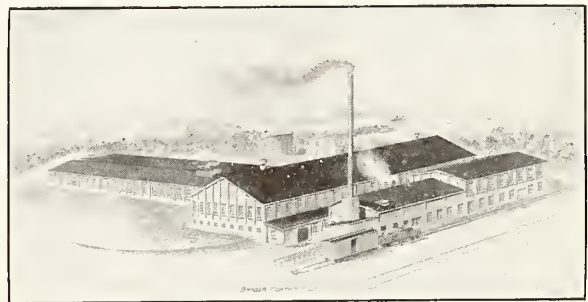
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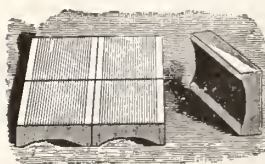


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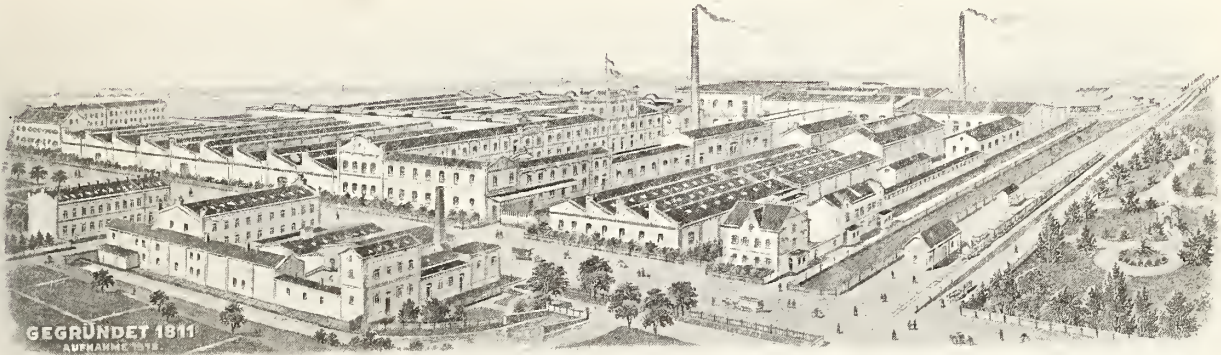
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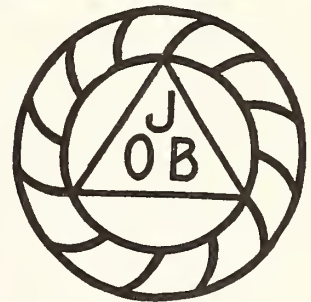
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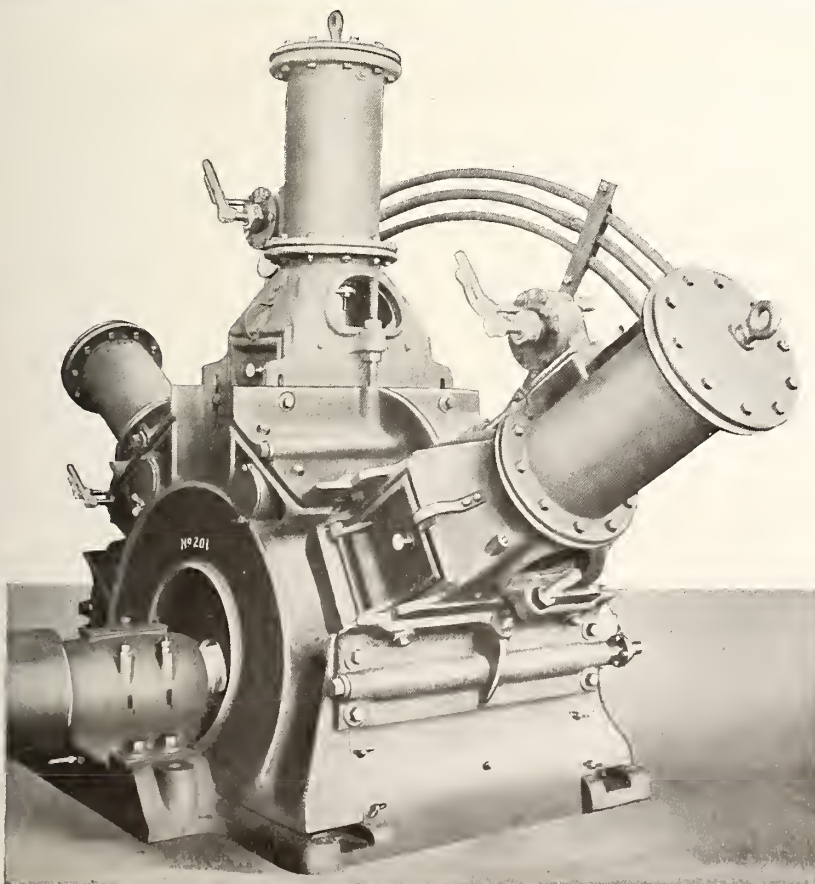
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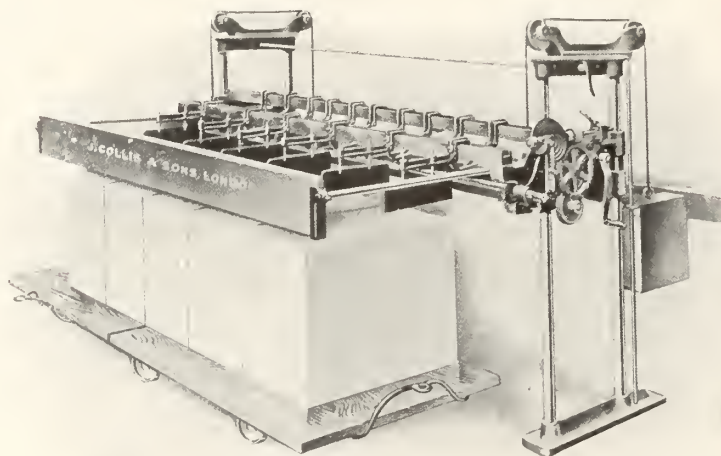
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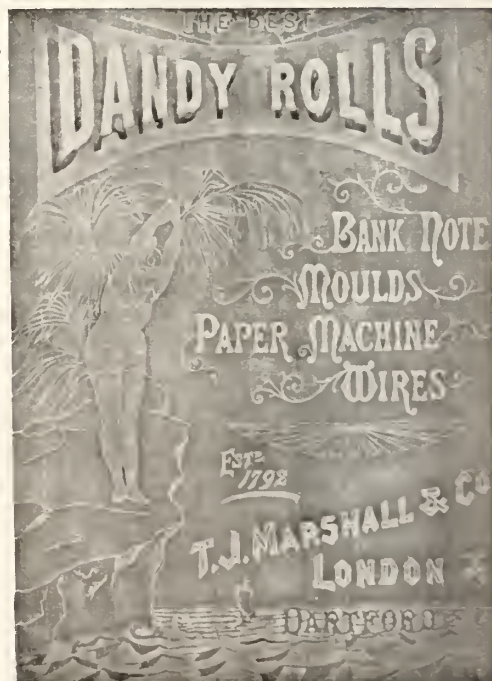
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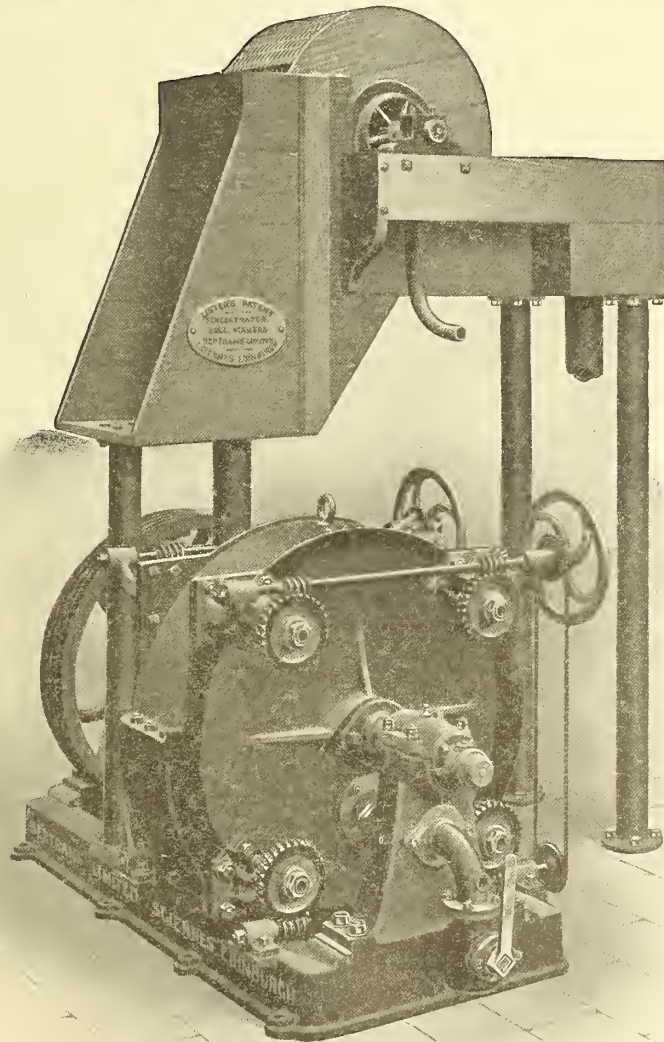
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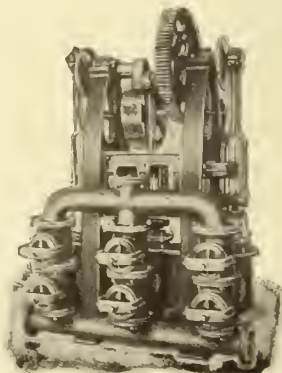
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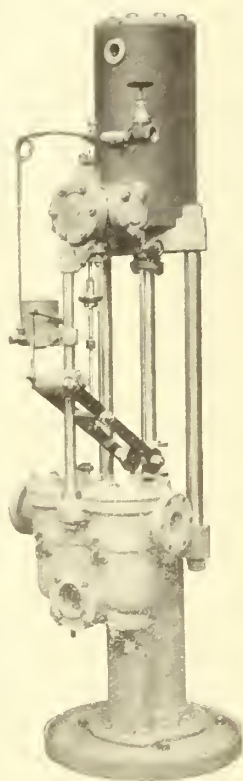
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PULP AND PAPER MAGAZINE OF CANADA

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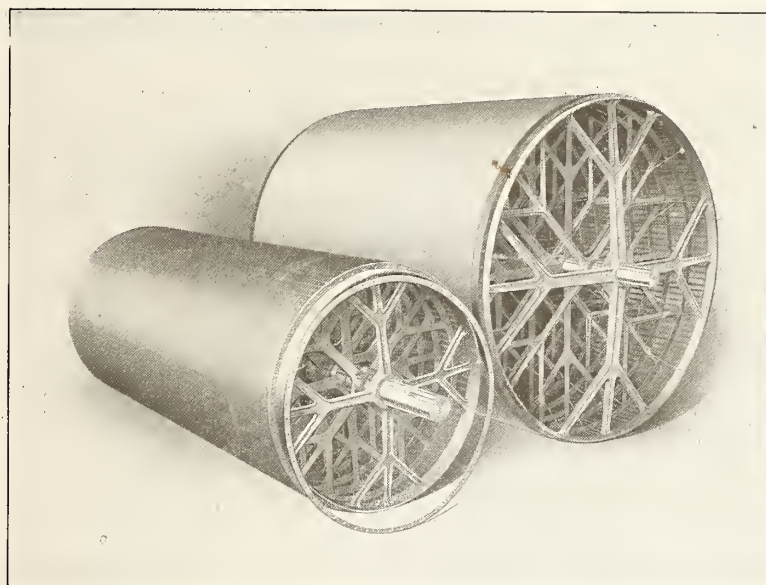
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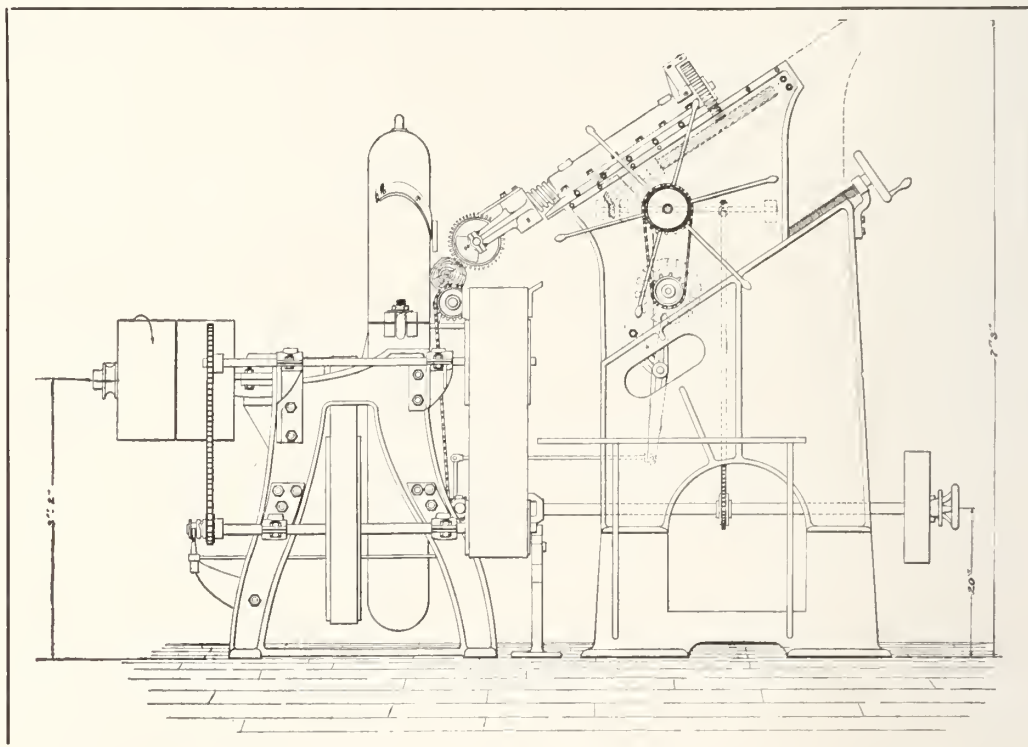
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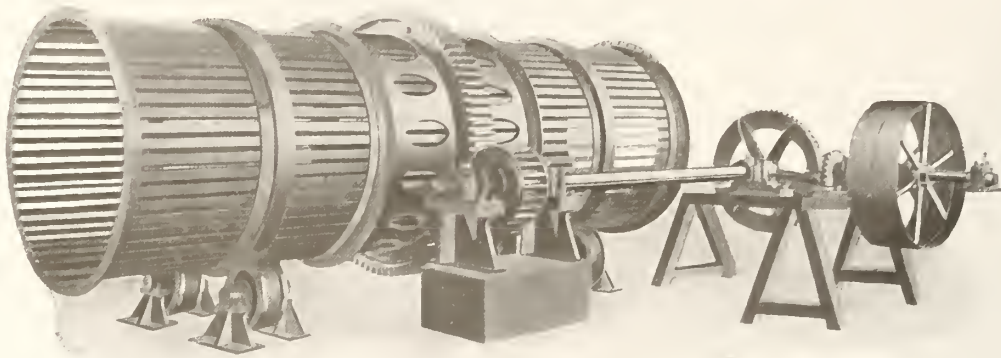
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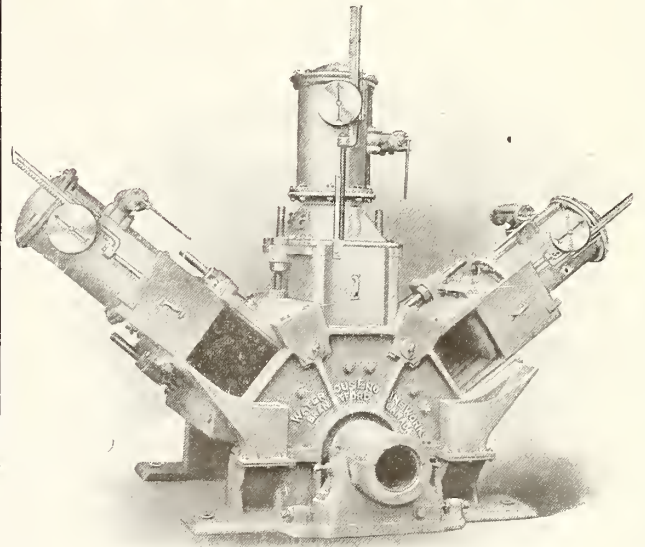
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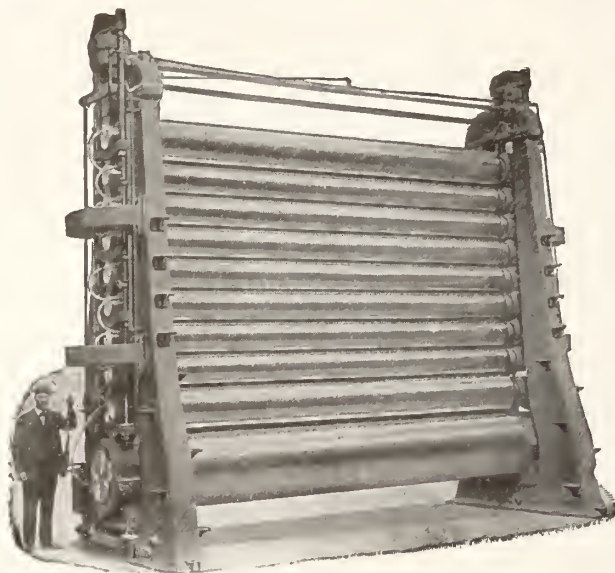
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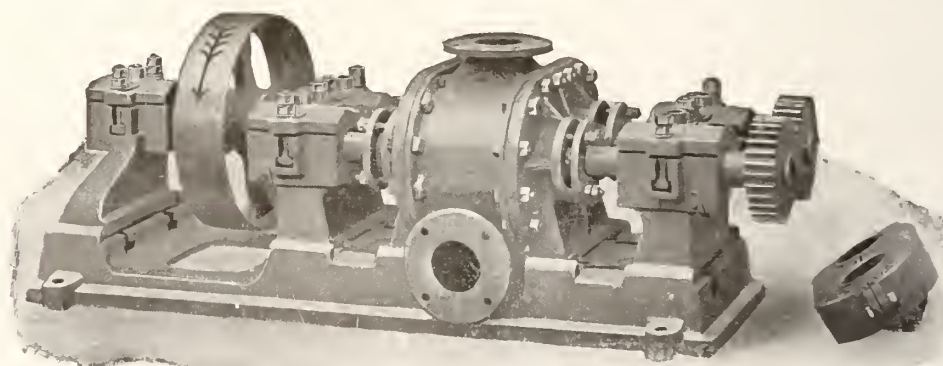
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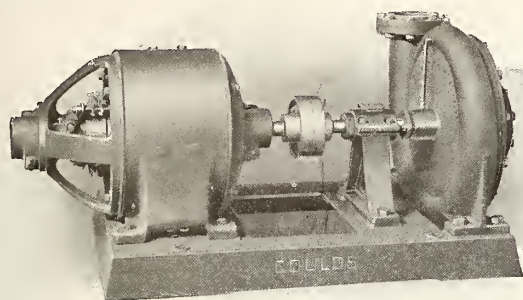


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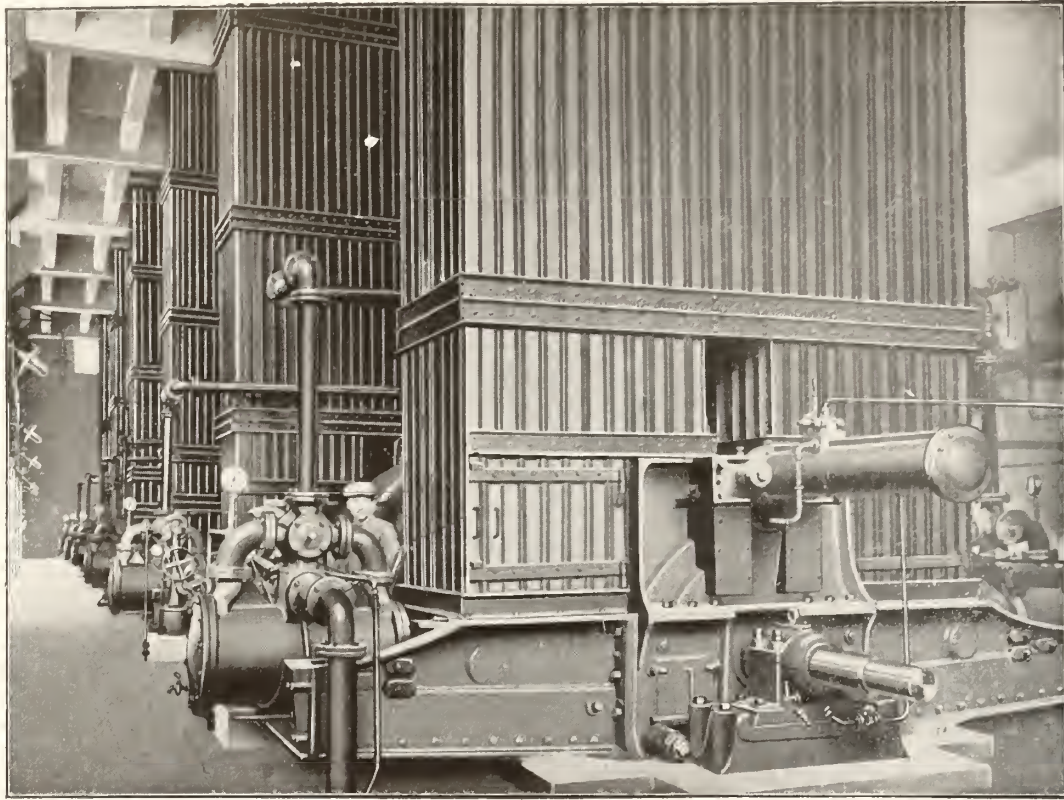
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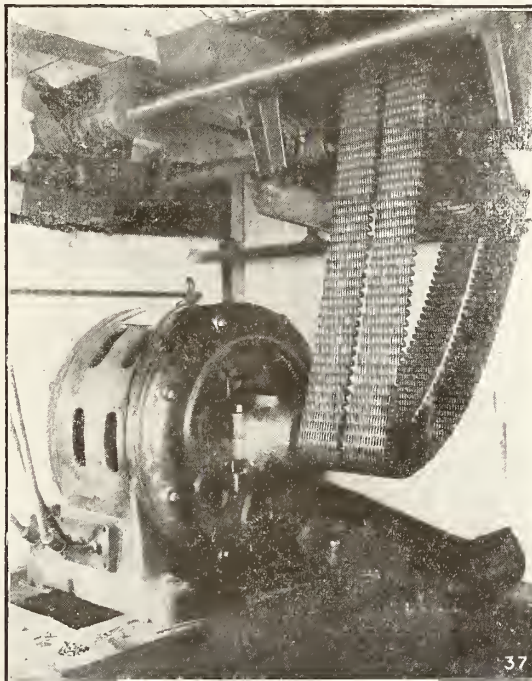
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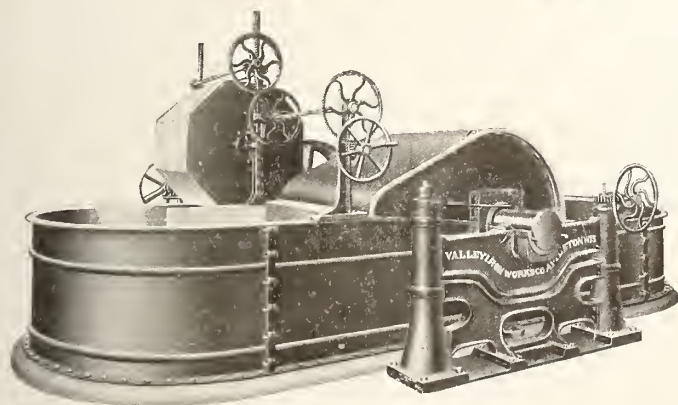
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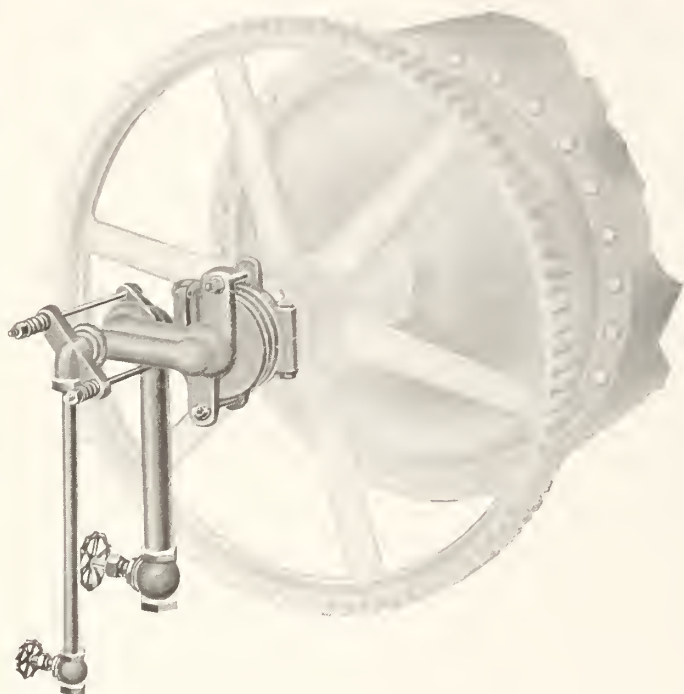
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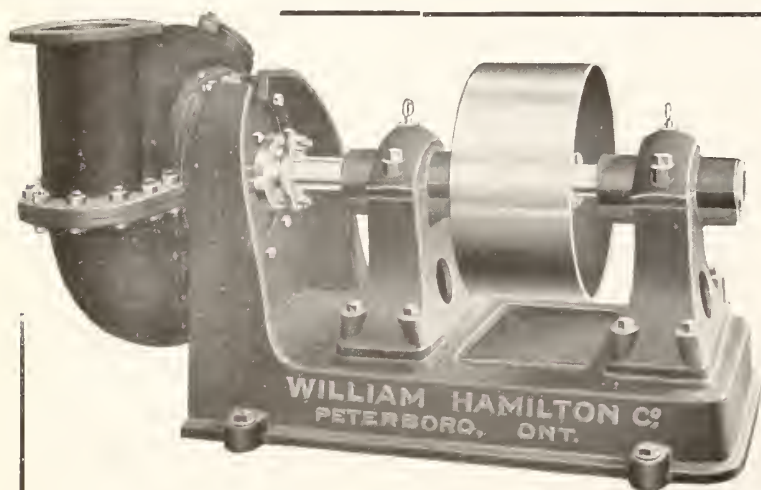
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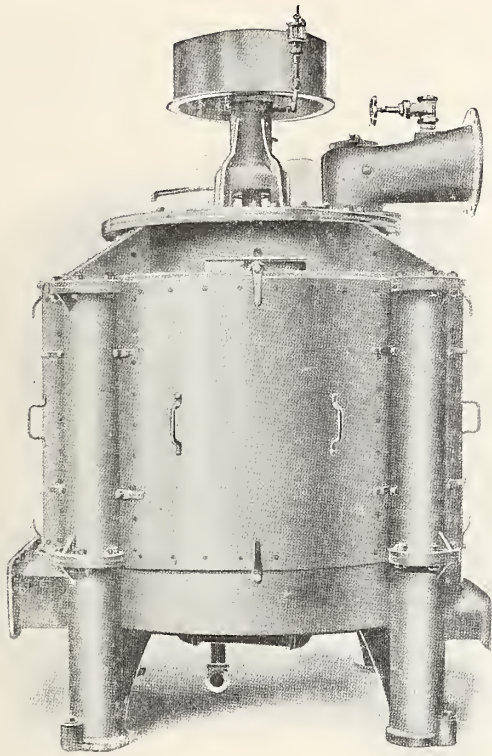
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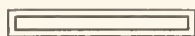
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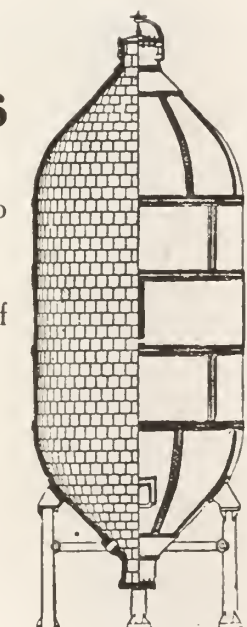
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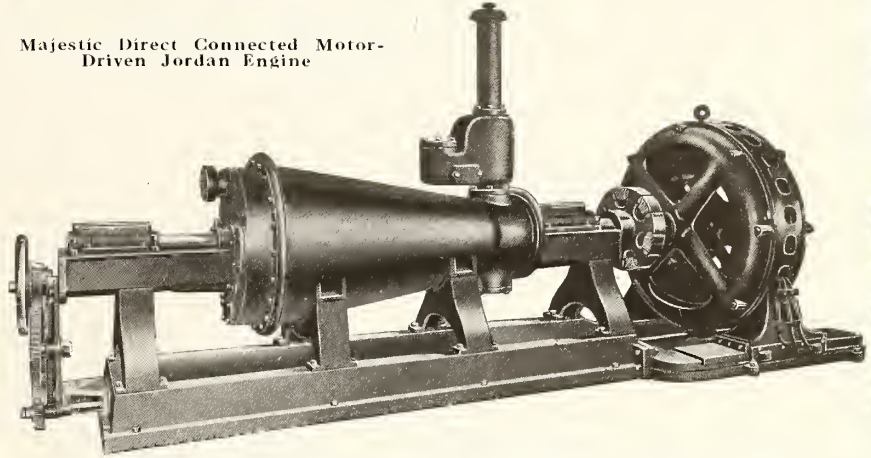


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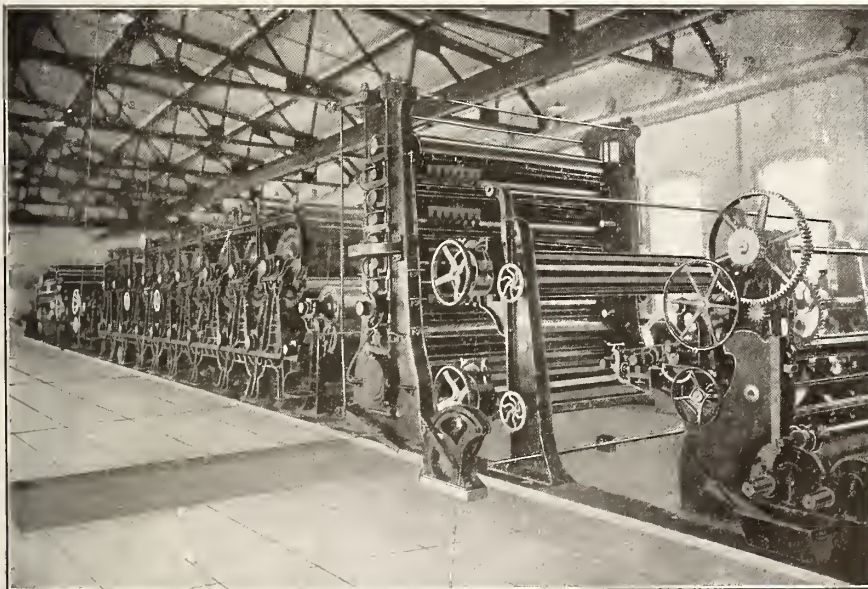
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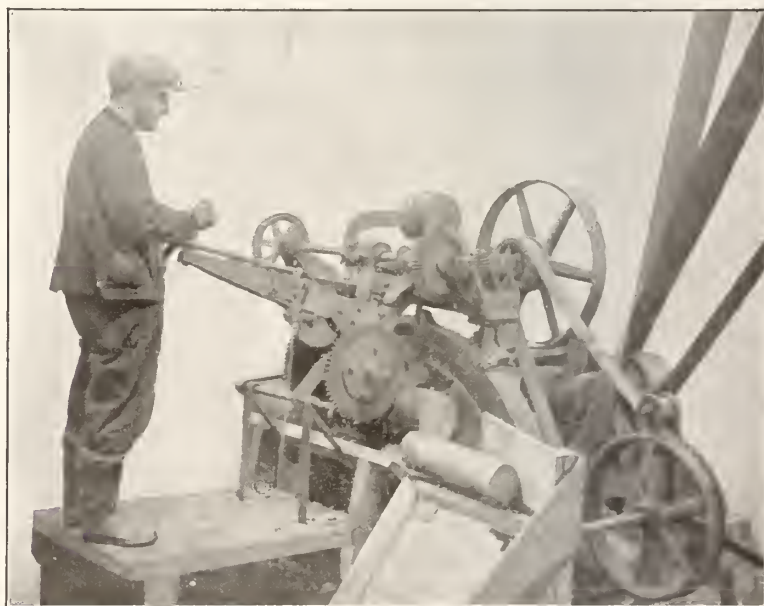
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VOL. XII.

MONTREAL, AUGUST 15, 1914

No. 16

The War

The great European conflict is begun, and all the world stands in breathless apprehension of the havoc that may be wrought. In two weeks' time the civilized nations have been completely changed over from industrious active peoples to devotees of Mars, in a supreme struggle whose outcome should be the eradication of that most troublesome and harmful element in the world to-day—German military despotism and autocratic rule. "An outbreak of barbarism," President Poincaré of France calls Germany's violence. The cost of the effort may be such as humanity has never before witnessed, but if democracy can establish itself over the "divinely-invested" Hohenzollerns and their pernicious rule, the ultimate result will be worth the sacrifice.

Never before have the nations come so abruptly face to face with the fact that the world is one, and that national boundaries are subsidiary to economic considerations. Germany gets no more flour from Russia; Britain, temporarily at least, gets no cotton from the Southern States; Canada gets no manufactures from Germany; France, Britain and the United States secure no pulp from Scandinavia and Germany, and so on through practically every class of commodity, which have for so many years been borne along the mighty channels of international trade. There will indeed be a cause for rejoicing if the war can be brought to a speedy close. May the bloodshed and the starvation not be great!

The question of the length of the war is the all-absorbing one. The general consensus of opinion is that it can not possibly last more than a year, with six months ventured as an estimate of the probable conclusion, and three months as well within the range of possibility. If half a year does not see the cessa-

tion of hostilities, it is altogether probable that our industrial life will be wrecked to an extent which we at the present time can hardly imagine. Secondary industries must necessarily give way to primary industries, because the bare cost of maintaining the fifteen millions of men in the necessities of life will cause a complete change from one class of production to another.

In the pulp and paper industry this question of duration is practically the main one. So far as America is concerned, as we stated in these columns in our last issue, there will probably be a curtailment of nearly all of the 350,000 tons per annum of pulp which come from across the water to America. Just how long the pulp industries in America can stand this loss, depends upon the length of time it is continued.

Sulphite is the point upon which this present situation largely devolves. If our digesters can be made to produce the requisite amount, American paper makers need not have any great fear for the demands which will be made. It is well known that sulphite manufacturers of the country have not been manufacturing to the full extent of their possibilities for a considerable length of time. This is as true of Canada as it is of the United States. Further, in Canada at the present time there exists a possibility of further increase through the operation for the first time of at least two new sulphite plants. A prominent news print manufacturer indicates that it is practically impossible to size up the situation at the present moment. He says that, "All that can be done is to speculate with more or less ingenuity." This statement certainly applies to the new orders which may come in to the news print manufacturers. For the old business under contract, it is altogether likely that there will be practically no change in prices or quantity since it would be shortsightedness on the part of paper makers to urge upon

the newspapers a higher price for that amount of paper by which contracts for a minimum are exceeded.

The feeling is strong among the officials of large companies that there is unquestionably going to be an unprecedented demand for newsprint during the continuance of the war, and while contracts will naturally be filled at their old prices, with the higher prices which will probably be demanded for sulphite and the advance to a normal basis of the prices on ground wood, manufacturers will be compelled to advance their spot quotations for new business.

Both in the United States and in Canada, mills which have been manufacturing other grades of paper such as wrapping, book and specialty will be turned to the manufacture of news print, and coupled with the present stocks including those in transit storage and the slack, there will be sufficient to supply all moderate needs. So far, despite the increase of from 50 to 160 per cent in the tonnage consumption of the metropolitan dailies there has been not the slightest apprehension on the part of newspaper managers. There is still plenty of room for the newspapers to cut down their head lines and use for the purposes of news instead of mere scare heads, white space which may prove so valuable. While it is probably true that the United States dailies can afford to pay a higher price for news print than Canadians, owing to the greater bulk of the manufacture and the practical certainty of an unusual heavy crop and open markets in South America for which American industries are clamoring at the present time, the cessation of the export of news print from the United States to Europe will minimize very heavy drains on Canada. Further, publishers are overbought and the keen competition of recent months will be replaced by normal conditions such as existed before the present financial stringency overtook America.

In the finer grades of paper there is still more room for speculation than in news print. The buoyancy of trades which are accustomed to advertise and make use of good papers is still problematical. The principal difficulty will come through the cutting off of supplies of cheap rags, china clay and dye stuffs as well as sulphite, great quantities of which have always been imported from Europe. In Canada the outlook as a whole is optimistic, even though a temporary derangement may be anticipated. The pulp and paper industry should sustain the shock of strife as easily as any other.

In Canada the sentiment is practically universal that the war is with the German governmental system, not the German people. No tribute is too high for the industry and inventiveness of the Teutons. In science and industry German scholarship and cleverness are the marvel of all. It is indeed a shame that such talents are to be forced into the channels of warfare to destroy and be destroyed.

Practical Forestry

In this issue of the Pulp and Paper Magazine, we have the peculiar privilege of presenting an account of developments along lines of forestry which give promise of being one of the foremost enterprises in the country in the maintenance of a perpetual supply of pulp wood. Up in the heart of that belt of territory which many an orator has dilated upon as a source of unending timber supply, a commercial company, which has at heart the earning of dividends for many years to come, and the support of a manufacturing institution of such a nature as requires an enormous investment of capital is actually planting seeds in the hope and expectation of reaping a crop of material which will keep them in perpetual comfort from the standpoint of raw material.

To Mr. Ellwood Wilson, Chief of the Forestry Division of the Laurentide Company, Canada cannot give too much credit for his enterprise and zeal along lines of forestry investigation and forestry practice. The fact that he has the support of the business management of the Company is one of the clearest indications of his far-sightedness and his keen appreciation of the value of scientific forestry. At the present time the wood consuming industries of Canada stand in very great need of just such work, and that the science and art of forestry such as is practised in continental countries has evidently a very excellent chance of becoming deep-rooted in Canadian soil is cause for the greatest satisfaction among manufacturers, conservationists and the public at large. The institution of forestry practice on a strictly commercial basis in our wood lands is undoubtedly an epoch-making event in our industrial development.

EDITORIAL COMMENT.

Since the beginning of the war Britain, France and Germany have been practically without paper. The paper famine has already set in, in France, and newspapers there have either ceased publication or are running two, four and, at the most, six pages of a reduced size. It appears that only a naval engagement and the clearing of the North Sea of menacing German ships can give Great Britain her needed supplies of pulp from Scandinavia. Otherwise an acute paper shortage is a certainty.

* * *

The Canadian and American China Clay industry should receive a distinct impetus in the present crisis. The deposits have been overlooked in favor of the Cornwall article, but the demand should stimulate our own producers into meeting the requirements of paper and textile manufacturers.

* * *

Makers of Fourdriner wires in the United States believe that their industry will be greatly advanced, through the cutting off of the German wires, which have been taking such a firm hold upon the market.

COMMERCIAL PLANTING OF SPRUCE

Laurentide Company starts in on extensive programme to create for itself a perpetual supply of pulpwood. A square mile a year to be planted with 600,000 to 800,000 trees.

By B. K. AYERS, M.F.

(Written specially for Pulp and Paper Magazine.)

The Forestry Division of the Laurentide Company has been in existence for about ten years now. For most of that period, the survey work has taken about all of its time and appropriation. This work, the mapping of water and timber on 2,350 square miles of limits, the running out, cutting and blazing of the limit lines; the estimate of the timber; and the other odd pieces of work such as survey of lots, trespasses and cuttings; has been almost finished. August 1st will see the end of the mapping; all but 120 miles of the outside boundaries have been run out and cut; and the mapping of cuttings is up to date.

During this time, the Division has also done a lot of the more technical forestry work, such as careful estimating, construction of volume tables for white and black spruce, balsam and white pine, growth studies of the same species and of jack pine and various studies of the past and present methods of logging, with an eye to their continual betterment. Many of the ideas of the Division, have, after careful consideration, been adopted; the logging goes on improving as to the am-

ever, but cold hard figures show that even this immense holding is inadequate, and that it will all be cut out in a term of years variously estimated at from 50 to 75. This still distant end of the present supply, and the possibilities of planting as a provision for the future, have long been foreseen by Mr. Chahoon, vice-president of the company, and, in keeping with his far-sighted and broad-minded policy, the company has decided to undertake planting operations.

Now away back in 1908, Mr. Wilson made the first plantations near Grand Mere. These plantations were of necessity very small. The first year they consisted of about 20 acres of white, jack and Scotch pine (see illustration). Each year since then some planting has been done. These latter have experimented with the pines, white and Norway spruce and European larch. Most attention was given to those trees which are used for pulp. For that purpose there are four species, three of them natives and the other a European, black and white spruce, balsam and Norway spruce. These have all been tried out here, both as to raising the small



Laurentide Company's Nursery at Grand' Mere now contains about 500,000 trees. Will be enlarged this fall to three times that capacity to supply 750,000 2-yr. seedlings yearly.

ount of tops, skids, etc., removed from the woods; the stumps are cut lower; and the more inaccessible timber, which has often been left in the past, and is being left to-day by many of the neighboring companies, is being cut and driven to the mill.

From the first, the idea of Mr. Wilson, Supt. of the Division, was that planting was the ultimate solution of the production of timber. Now it is not to be expected that a planting policy would be accepted by the Company without a great deal of discussion and opposition. Canada's supply of pulp wood is the greatest in the world. The St. Maurice Valley includes 15,000 sq. miles of the most accessible pulpwood in the Dominion, lying in a very favorable location with regard to water power sites as well as easy shipment, and the Laurentide Company's 2,350 square miles is of the best of this. Most people would think that this amount of territory would keep the mill in logs for

trees in the nursery and the planting of them in the field. Seeding direct in the field has also been tried, but with no success.

In this way, the three native species have been found to have serious drawbacks the black spruce that it grows very slowly, the white spruce and balsam, that they are hard to get started and to raise in the nursery. On the other hand, the Norway spruce is a very rapid grower and at the same time is very easy to grow in the nursery.

Experiments also proved that trees bought from outside nurseries are not at all satisfactory, the native Canadian stock rather inferior in quality and the American stock not adapted to this climate. (The New England stock, which is best fitted, is forbidden entry into Canada, because of the fear of the spread of two pests prevalent there, namely the gypsy moth and the blister rust of pine.) On the other hand, plants grown

on the ground are strong and hardy, and if grown in sufficient quantity, can be grown here cheaper than they can be bought.

Following these conclusions, a nursery was started in Grandmere in 1912. That year but two seed beds were made, and the press of other work caused these to receive less than their due of attention. But in 1913 a competent man was put in charge for the season, one acre of land in the edge of town was fenced off, a water system was put in and 41 beds were made



Scotch pine planted in 1908 near Grand Mere.

and sown, 15 in the Spring, and 36 in the Fall. The planting done in 1913 was also much more than in the previous years, being about 20,000 trees of Norway spruce, white spruce, white pine, Scotch pine, and European larch. The season was particularly dry and unfavorable, and the results very disappointing, but for all that immensely valuable for the lesson taught.



Land formerly having pure stand of pine, cleared for farm 10 years ago, but soil too poor and so abandoned. A class of land that never should have been cleared. Planting trees is the remedy.

One of these is the one that I have already mentioned, that only home grown stock can be depended on. Another, that spruce can not be planted upon the open sandy fields with success unless the season is favorable, and a third, that Fall seeding and planting are preferable to Spring planting and seeding.

This outlines the situation both in the survey and in planting up until 1914. With the former work well in hand, the fire protection taken care of by a co-operative association, the St. Maurice Fire Protective Association, and time being ripe with regard to planting, the latter had to be tried out on a more extensive scale than was formerly possible.

With only 10,000 trees available from the nursery, 100,000 three-year old Norway spruce seedlings were ordered from the Pejepscot Paper Co., of Cookshire,



Clear burn of Laurentide Company's limits on Upper St. Maurice. Burned over repeatedly, taking most of the soil. Reproduction poor and scattering. Jack pine, poplar and white birch all of small value for pulp, coming in much faster than the desired spruce. Remedy: First keep out the fire; then, where possible, plant.

and all preparations were made to plant them as soon as the ground thawed, a part to be put in right on the edge of Grand Mere itself, but most of them on the company farm, 6 miles up the St. Maurice. A man was



Underplanting young poplar and white birch with Norway spruce—Laurentide Company, May, 1914. Ideal conditions for spruce. The poplar and birch afford perfect protection for the spruce and in 15 years or so will either die out or be overtaken in growth by the spruce, which will then occupy the whole space.

sent down to Cookshire to look over the plants and to inspect the shipping.

The first shipment of 25,000 trees arrived in Grand Mere on May the 6th, when snow was still on the ground in many places. Planting was, however, immediately started on a warm south slope with a crew

of eight Italians, and supplemented by four boys, who worked after school in the afternoons. 15,800 trees were put in on 10 acres in a week.

In the following three weeks planting was carried on at the Farm with a crew of Italians that averaged 12. There, 74,850 trees were put in on 54 acres for a total cost of \$807.25, which is \$10.76 per thousand trees and \$14.95 per acre. This plantation is interesting in a number of ways, consideration of which necessitates a description of the area planted.

The "farm" lies on the West bank of the St. Maurice, and the larger part of it is a flat-lying sandy land, 150 feet above the River. This land for the most part was formerly covered with a pure stand of white pine,



3-yr. Norway spruce seedlings planted in May, 1914, on ground burned clear in 1910. Trees did excellently, and many of them made up a growth of 8 inches to 1 foot by the last of July. First pulp should be cut from this plantation as thinnings in 15 or 20 years, and expected to cut 50 cords per acre in 50 years.

which was cut off, and the area afterwards burned over, some 12 years ago. While sandy on the surface, the sand is underlain with clay, and there is plenty of water down 6 or 8 feet, as shown by the wells on the neighboring farms, and by the swamps on an adjoining tract of but very little lower level.

After the fire which followed the cutting of the pine, the tract grew up to white birch and poplar, and it was this young rather open stand that was planted, the idea being that spruce planted in the partial shade of the birch and poplar would be able to become established, even on the dry sandy soil, while if planted in the open, as was done in 1913, it would dry out before the roots could get down to the water and would die the first season. Once established the spruce will grow well in the partial shade, and if necessary the birch and poplar can be cut out when large enough (say in ten years) for pulp or cord wood.

The planting, as has been said was done by Italians; from three to five men went ahead, each with a mattock first clearing off a place for the plant, and then making a hole from 6in. to 1 foot deep. Each man took a single row, the first man keeping approximately 5 feet from the previous line and the others following him, keeping five feet from the man next in front. The rest of the crew followed, each with a bunch of trees kept wet in a pail of mud and water, or in a small

piece of burlap wrapped around the roots. This method is rather slow but was thought necessary, because of the large size of the trees, some of which were 12in. or more in height, and because care was needed on this unfavorable site.

The cost as given was \$14.95 per acre, divided as follows:

Cost of trees - - - - -	\$4.16
Express on same - - - - -	0.53
Labor - - - - -	8.11
Supervision - - - - -	0.96
Miscellaneous - - - - -	1.16

the last item covering the expenses of man to inspect the trees and their packing, carting trees from R. R., and expenses of the man in charge.

This analysis shows where the reduction can be made in the future planting. Two year old seedlings raised in the Grand Mere Nursery will cost not over \$1.50 per thousand or \$1.75 to \$2.25 per acre. The express item can be eliminated or reduced to not over 10c. per acre. Labor, the biggest item, can be materially cut down by using smaller trees, and boys to put them in, so that this item should be reduced to \$5 per acre. Supervision is about right. Incidentals can be probably cut in half, so that future planting should be done at a figure of from \$8 to \$10 per acre.

The company nursery at Grand Mere has been enlarged to 115 standard (4 ft. by 12 ft.) seed beds, and a better water system put in. From this nursery about 25,000 two-year-old seedlings will be ready in the Fall of 1914, or Spring of 1915, and about 500,000 trees every two years or 250,000 a year is sufficient to plant about 200 acres a year. Seeding was finished this



Italian planting crew putting in trees on side hill. Two men with mattocks.

year on June 18th. At that date half of the beds seeded had already germinated, and on July 1st all the seed was up.

Plans are already on foot for the purchase of 50,000 more Norway Spruce seedlings to be planted this Fall with the 25000 from the Company nursery. Next year (1915) between 250,000 and 300,000 trees will be put in, thus leading up to a planting program of 500,000 to 750,000 or some 400 to 600 acres each year.



NEW PATENTS



**Drier-Rolls for Paper Machines—William Sheahan,
Oregon City, Oregon, Inventor; Patented
July 21, 1914.**

My invention relates to paper making, and particularly to paper making machines wherein the paper web after leaving the press rolls is run over a series of drier rolls between drier felts. In the first stages of these machines the leading end of the paper web had to be thrown between the felts by the operator, in order to conduct the paper web from one to the other of the drier rolls. In the latter improvements, endless tapes were provided for conveying the leading end of the paper web from roll to roll. The difficulty with such means of conveying the paper web from roll to roll is, that it lacked means for causing the tapes to run at the proper speed relatively to the roller over which they are running, and in consequence there was

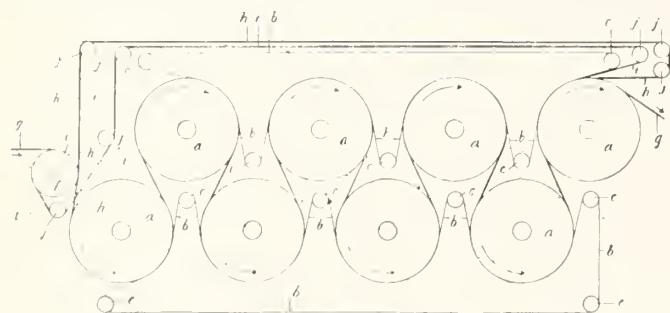


Fig. 1

a tendency of the web of paper being torn. The tapes for conveying the paper web from one drier to another could not be successfully run on the periphery of such drier rolls for several reasons which are manifest when pointed out; for example, if the tapes are run on a surface lying in the same plane as that on which the drier felt is running, the latter would have a tendency to run on the higher surface produced on the periphery of the drier roll by the tapes, and the tapes, running over the web of paper, having a slightly greater speed than the drier rolls, would have a tendency to tear the paper web, especially at the point where such overlying tapes pass from one drier roll to another. Furthermore, the edges of the paper web nearest the tapes are held slightly spaced from the periphery of the drier roll, and thus there would be a tendency to cause imperfect drying of the paper web.

To avoid this annoyance and incidental loss is the object of my invention.

I attain my object by providing at the ends of the drier rolls peripheral surfaces sunken below those of the body of the roll, the tape-carrying faces of the ends of such sunken surfaces being located in a plane determined by the thickness of the tapes, so as to cause the tapes to travel at the same speed as the carrier rolls while traveling on the latter.

The details of my invention are hereinafter fully described.

In the accompanying drawings: Figure 1 is a diagrammatic side elevation of the drier section of a paper machine, indicating by arrows the direction of travel

of the drier rolls: Fig. 2 is a side elevation, partly in section, of one end of one of the drier rolls, illustrating the construction of the sunken peripheral surfaces for carrying the tapes by which the leading end of the paper web is conducted from one drier roll to the other; and Fig. 3 is a view similar to that shown in Fig. 2, showing that the sunken end may be made integral with the drier roll, instead of being obtained by means of an attachment to the ends of the drier rolls, as shown in Fig. 2.

In Fig. 1, a represents diagrammatically a plurality of drier rolls journaled in staggered form, positively driven in the direction indicated by the arrow in this figure by suitable means, not shown in the drawings. The endless drier felts b run over the idler c, and over and with said drier rolls, the felts being moved by their frictional contact with the drier rolls.

Referring now to Fig. 2, this shows pieces as bolted to the ends of each drier roll, the end of the drier roll not shown being understood to be identical with that shown. The purpose of such end pieces, d, is to provide peripheral surfaces at the ends of the drier rolls sunken below the peripheral surface of the main body of the roll, for carrying the endless tapes by which the leading end of the web of paper is carried from one drier roll to the other. The tape carrying faces of said sunken peripheral surfaces must be located in a plane determined by the thickness of the tapes, so as to cause the latter to travel at the same speed as the carrier rolls by which they are supported. At the starting end of the drier section, having reference to the left end of Fig. 1) is provided the usual "baby drier" which is understood to be located directly in front of the press rolls (not shown) and the paper web, g, is supposed to be fed from

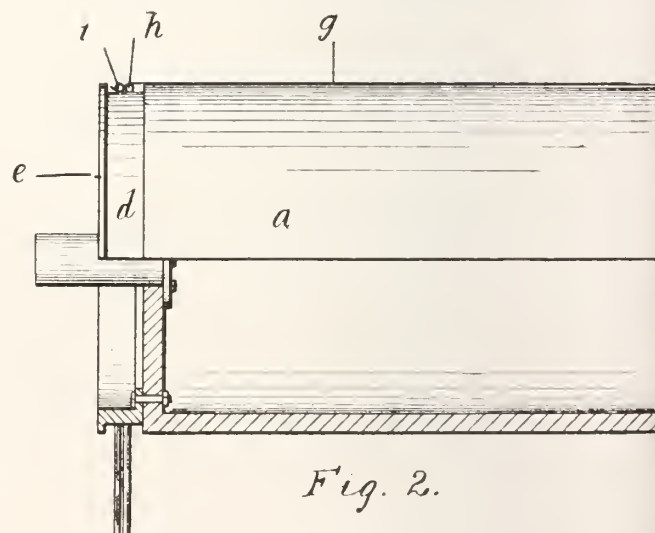


Fig. 2.

the press rolls to and over said "baby drier." The endless tapes or carriers b, i, run parallel, side by side, over all the drier rolls, in said sunken surface ends. I also prefer to make the sunken peripheral surface ends with flanges, as e, at their outer extremities. The tapes, b, i, are returned to the starting point over the idlers j, k. As the paper web, g, is delivered from the press rolls its leading end is fed between the tapes or carriers

h, i. The paper web is thence conducted over the drier rolls to the calender end of the drier section, from whence it is delivered to the next section of the machine. As obvious, the paper web is carried over and around each driver roll without any attention being required from the operator. It may be found desirable

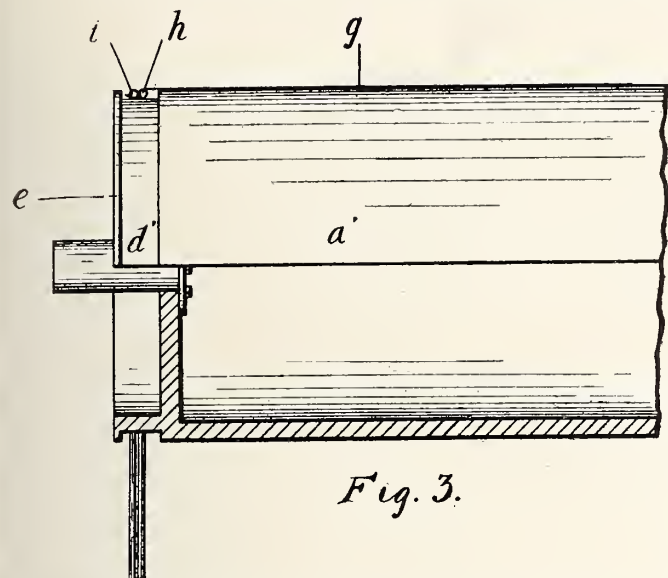


Fig. 3.

to make said surface ends integral with the drier rolls. In such case the construction shown in Fig. 3 will be found convenient. In this view the drier roll is represented by a, the sunken peripheral surface by d, and e represents the flange which I preferably provide to prevent the tapes from running off the ends of the sunken surfaces.

**Bark-Rossing Machine—William G. Hafner, Clay, N.Y.,
Inventor; Patented July 7, 1914 .**

Specification of Letters Patent. Application filed December 18, 1912. Serial No. 737,383.

This invention has for its object the production of a bark rossing machine which is particularly simple in construction, and highly efficient and rapid in operation; and the invention consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

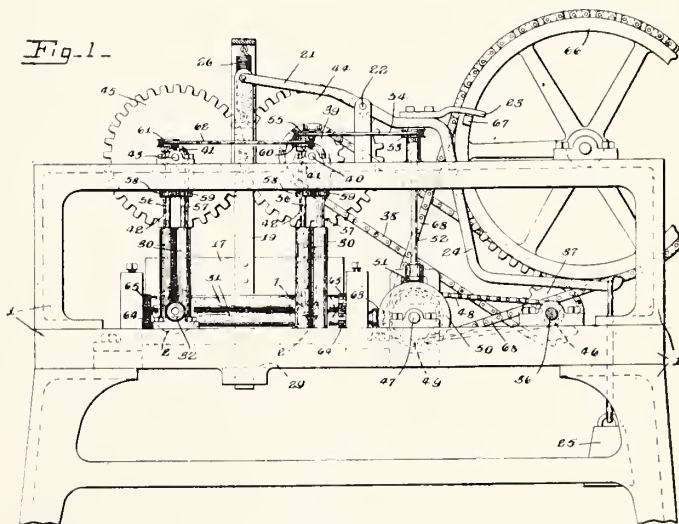
Figure 1 is a front elevation, partly broken away, of one embodiment of my invention. Fig. 2 is a side elevation, partly in section, looking to the right in Fig. 1. Fig. 3 is a fragmentary view of parts seen in Fig. 1, parts being omitted, illustrating particularly the means for gripping and carrying away the removed bark. Fig. 4 is a front elevation of the rotatable member carrying the bark removing means. Fig. 5 is a sectional view on line "A—A," Fig. 4. Fig. 6 is an elevation of a modified form of the bark removing means seen in Fig. 4.

This bark rossing machine comprises, generally, a rotating member having a passage through which the branches are passed, means carried by said member and projecting into the passage to remove the bark, means for carrying away the removed bark from one end of the passage of said member, means for feeding the branches through the passage, and means for actuating the feeding means, the rotating member and the means for carrying away the removed bark. However, some of the foregoing parts may be omitted if desired.

1 is the frame of this machine, which may be of any desirable form, size and construction.

2 designates the rotating member having an axial passage 3 through which the branches are passed, the member 2 having a hub 4 detachably secured as by screw threads to the body of said member 2, and this hub being journaled in a suitable bearing 5 formed in a supporting bracket 6 supported by the frame 1 near the front side thereof. The hub 4 is shown as provided with a peripheral surface for receiving the power to rotate the member 2, this surface being shown as sprocket teeth 7. In this embodiment of my invention, I have shown a double machine, that is, one having two rotating members 2, and double feeding and bark carrying away means, all driven from a common power shaft, and a description of one set of mechanism will be sufficient for both.

The means carried by the member 2 and projecting into the passage 3 for removing the bark from the branches comprises preferably a pair of jaws 8 projecting into the passage 3 near the receiving end thereof, these jaws being here shown as sliding in radially extending guides 9 formed in the front face of the member 2 and as being pressed toward each other by springs 10. The guides 9 are covered by suitable plates 11 which are held in position by screws 12. The jaws are formed with faces 13 inclining from their outer sides toward the centre of the passage and terminating in edges 14 which normally meet in a straight line crossing the passage and engage the branches, these faces 13 facing outwardly in order to engage the advance ends of the branches being passed into the passage 3. The faces 13 act together as a funnel to guide the branches between the jaws as the branches are being pushed into the passage 3, said faces 13 forming comparatively sharp edges on the opposing faces of the jaws 8; and owing to the rotation of the member



2 carrying the jaw 8, the edges loosen the bark, and owing to the feeding movement of the branches through the passage 3 the loosened bark is scraped off.

The springs 10 are located in lengthwise slots 15 in the bodies of the jaws and each spring is interposed between one end of the corresponding slot 15 and a pin 16 projecting from the bottom of the corresponding guide or channel 9 into the slot near the other end thereof, the springs being strong enough to overcome the centrifugal force of the member 2 and to press the jaws toward each other and hold the same engaged with the branches. However, as seen in Fig. 6, the jaws may be arranged with their heads located on the

opposite sides of the centre of the member 2 from the sides on which their body portions are located, in order that the centrifugal force may be utilized to draw the heads of the jaws toward each other.

The means for carrying away the removed bark from the entrance end of the passage comprises two members arranged on opposite sides of the passage, that is, above and below the same, one as the upper member being movable toward the other across the passage to grip the removed bark, at the entrance end of the passage, between the same and the other member, and the two members being then movable downwardly together until the bark has been carried away from the member 2, and said two members then separating permitting the bark to drop beneath the machine, whereupon the gripping members are returned to their normal position.

Fig. 2 -

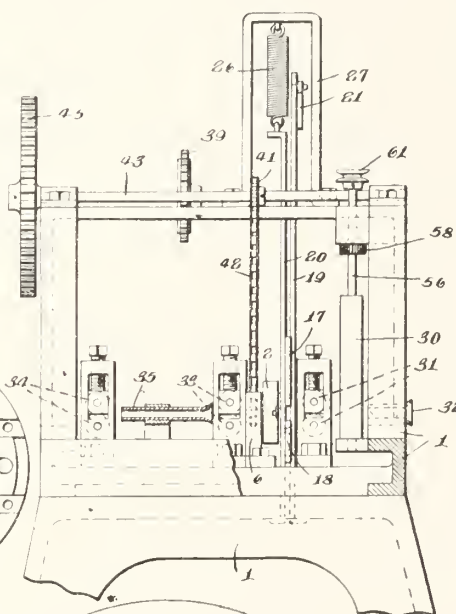


Fig. 6 -

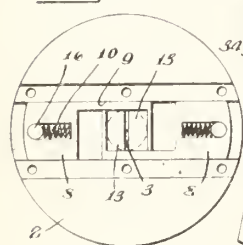
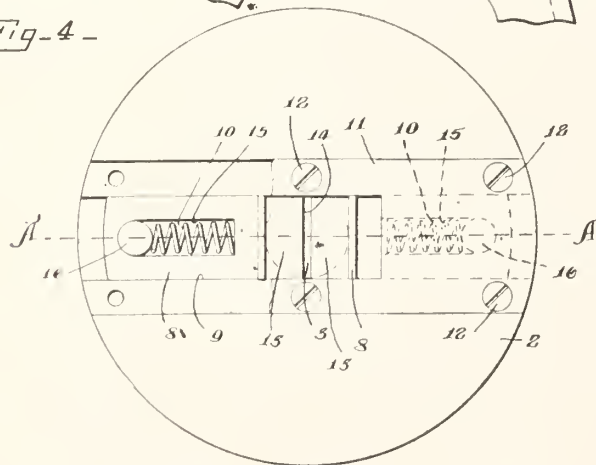


Fig. 4 -



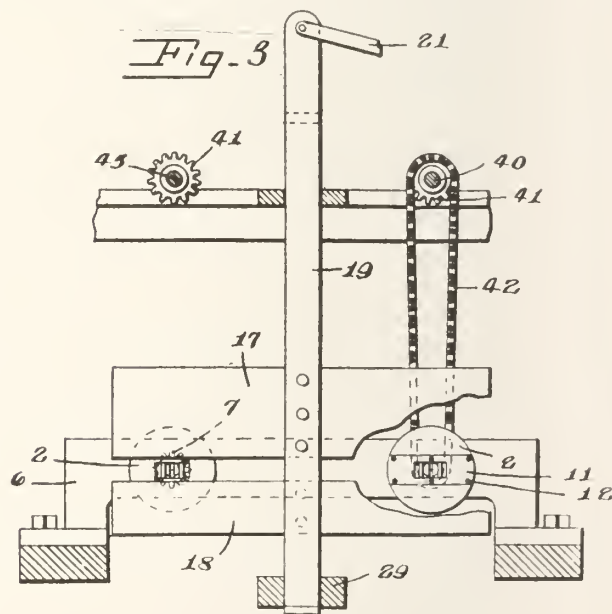
The gripping members consist of jaws 17 and 18 carried respectively by reciprocating parts 19, 20, extending upwardly, the support for the upper jaw 17 being connected to a lever 21, Fig. 1, pivoted between its ends at 22 to a suitable bearing supported by the frame 1, this lever 21 having an arm 23 arranged to be engaged by the power driven means to be described, and another arm 24 to which is connected a returning weight 25. The other support 20, is connected at its upper end to a returning spring 26 suspended from a yoke 27 at the top of the frame of the machine.

In operation, the jaw 17 is moved downwardly by the lever 21 across the passage 3 and grips the accumu-

lated bark between its lower edge and the upper edge of the jaw 18, whereupon the downward movement of the jaw 17 is transferred to the jaw 18 until the jaw 18 engages a stop 29 provided on the frame. Fig. 3, when the weight 25 is permitted to raise the upper jaw and hence separating the jaws and permitting the bark to drop. The weight 25 and spring 26 then return the jaws to their starting position. The weight 25 is arranged to act quicker than the spring 26 so that the upper jaw will open faster than the lower jaw will close. The jaws 17 and 18 are controlled and timed in their operation by the projection 67 on the wheel 66 and the operator inserts the branch between the jaws 8 immediately after the jaws 17 and 18 have opened and as there is but one projection 67 and the wheel 66 is large and revolves comparatively slowly, there is ample time for the branch to pass through the member 2 before the jaws 17 and 18 again close. The jaws 17 and 18 for both rotating members 2 in the double construction here shown are supported by one set of supports 19 and 20.

The means for feeding the branches into the passage 3 includes two sets of rollers 30, 31, arranged in front of the passage 3, the rollers being arranged at an angle, usually at a right angle to each other, and the planes

Fig. 3 -



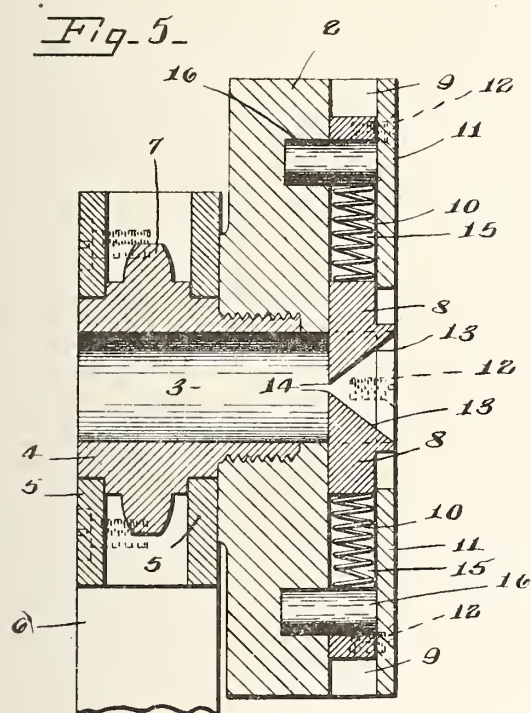
coincident with the points of tangency of the pairs intersecting a line substantially coincident with the axial line of the passage 3. A guide as a tube 32 is also arranged in advance of these rollers with its axis aligned with the axial line of the passage 3. The means for feeding the rollers also includes means for drawing the branches through the passages, this means including two sets of rollers 33 and 34 spaced apart, and a tube 35 interposed between the pair of rollers and arranged with its axis substantially coincident with the planes of tangency of the rollers 33 and 34 and with the axis of the passage 3.

The actuating means includes a power shaft 36 journaled in suitable bearings in the frame, and power transmitting means between this shaft and the various moving parts of the machine.

The power-transmitting means between the shaft 36 and the rotating members 2 includes a sprocket wheel 37 mounted on said shaft and connected by a sprocket chain 38 to a sprocket wheel 39 mounted on a shaft

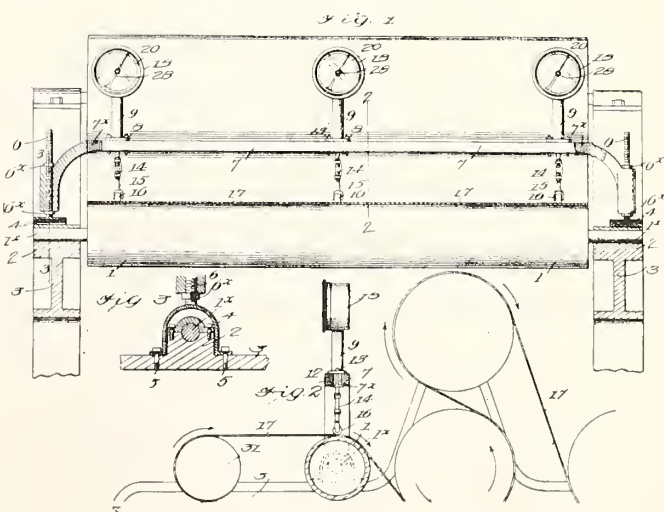
The vertical feeding rollers 30 are driven from the power shaft 36, by means of a sprocket wheel 46 on said shaft 36 and connected to a shaft 47, journaled in a bearing in the lower part of the frame, by means of a sprocket chain 48 running over the wheel 46 and a sprocket wheel 49 on the shaft 47, and the shaft 47 is connected to the first set of vertical rollers by means of a beveled gear 50 thereon meshing with the beveled

In operation, the operator passes the branches into the passage 3 at the same time and during the rotation of the members 2, the bark is wholly removed by the jaws 8 and accumulates in front of the members 2 and the branches having passed through the passages 3, the jaws 17 and 18 descend and carry away the removed bark, the operator gauging the time in which he places the branches in the passages so that the branches will have entirely passed through the passage by the time the jaws operate.



The shaft 47 extends from front gear of the machine and is provided with two additional beveled gears 50 located in position to mesh with the beveled gears 63

A further object of our invention is to provide a gauge which may be turned so as to be readable from various parts of the room in which the machine is situated.



A further object of our invention is to provide a special form of gauge which will register variations of 1-10,000 of an inch in the thickness of the paper.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

Our invention is illustrated in the accompanying drawings forming part of this application in which—

Figure 1 is a section through a portion of the device, the gauge being shown in elevation. Fig. 2 is a section along the line 2—2 of Fig. 1. Fig. 3 is a section along the line of 3—3 of Fig. 1. Fig. 4 is a vertical section through the guage on the line 4—4 of Fig. 5. Fig. 5 is a section along the line 5—5 of Fig. 4, and Fig. 6 is a section along the line 6—6 of Fig. 4.

In the making of paper, especially where the paper is made in strips of considerable width, it is the custom to provide a plurality of feed devices for properly dis-

tributing the pulp so as to form sheets of uniform thickness. In the initial run of a mill the finished paper which comes from the calender rolls is measured or gauged and if any particular part of the sheet, such as the centre, or a portion toward one edge or the opposite edge be found thinner or thicker than desirable, more or less of the pulp is fed from that particular feed spout which corresponds with the portion of the sheet to be changed. In mills which employ modern machinery it will be seen that a considerable length of paper is virtually wasted before the pulp feeding devices have been properly regulated. The paper

which is not uniform in thickness is generally rejected and only that used which conforms to a certain standard thickness.

An object of our invention is to provide a guaging device which will guage the thickness of the sheet of paper before it has reached the drying rolls so that proper regulation of the pulp feeding device may be made before the paper has passed over the drying rolls, thereby obviating the loss and delay formerly occasioned.

In carrying out our invention we provide a base roll 1 whose shaft 1x is mounted in bearings 2 on the main frame 3 of the machine. A yoke 4 is secured to the frame 3 by means of bolts 5 or in any other suitable manner as shown in Fig. 3. This yoke straddles the bearings 2 and is provided with an upwardly threaded arm 6. The arm 6 on each side of the machine form, together with the nuts 6x, supports for a transverse frame 7. The latter is provided with a longitudinal slot 7x, which extends for a distance approximately equal to the width of the sheet of paper to be formed.

Secured to the frame 7 and arranged to be adjusted in any position therealong are a plurality of guage members like those shown in Figs. 4 and 5. A description of one of these guage members will suffice since they are all alike.

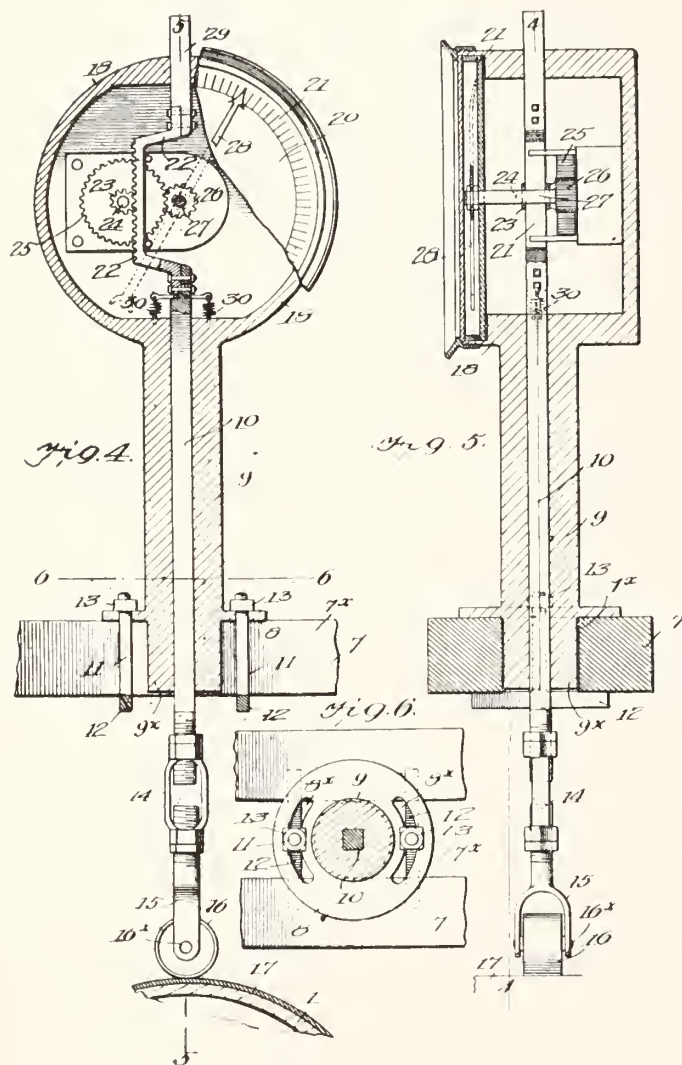
In Fig. 4 we have shown the guage as consisting of a base plate 8 arranged to support a central standard 9 which is provided with a central bore arranged to receive a rod 10. The standard 9 has a slightly reduced extension 9x at its lower end arranged to enter the slot 7x (see Fig. 6). The plate 8 is provided with a pair of arc-shaped slots 8x arranged to receive the threaded arms 11 which extend upwardly from integral cross members 12. The latter are disposed beneath the frame 7. Nuts 13 are provided for clamping the standard 9 in position.

The lower end of the rod 10 is threaded to enter one end of a turn buckle 14. A forked rod 15 is threaded to enter the other end of the turn buckle and bears a roller 16 which is arranged to engage the paper strip 17 as it passes over the base roll 1.

Carried by the standard 9 is a hollow casing 18, which is provided with a dial 20. The latter is divided by means of a graduated scale 21 so as to indicate a difference of 1-10,000 of an inch in the thickness of the paper. The rod 10 is secured to a U-shaped rack member 22, which engages a pinion 23 on a shaft 24. The latter bears a gear 25, which engages 26 on a shaft 27 bearing a hand 28. At the upper end of the U-shaped rack member 22 is a guide stem 29 which projects through an opening in the casing 18 for guiding the rack in its movement. Springs 30 are provided for exerting a downward tension on the rod 10.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

The paper sheet or band 17 passes from the press roll 31 over the base roll 1 as shown in Fig. 2. Gauges such as these described are secured to the frame 7 at various intervals along the frame. In Fig. 1 we have shown three of these guage members but it will be understood that more or less may be provided without departing from the spirit of the invention. As the paper passes underneath the roller 16 the thickness of the paper will be accurately registered by the guage. The hands 28 of these gauges should, of course, register the same thickness, but in case they do not it will be at once apparent to the operator which portion of the



tributing the pulp so as to form sheets of uniform thickness. In the initial run of a mill the finished paper which comes from the calender rolls is measured or gauged and if any particular part of the sheet, such as the centre, or a portion toward one edge or the opposite edge be found thinner or thicker than desirable, more or less of the pulp is fed from that particular feed spout which corresponds with the portion of the sheet to be changed. In mills which employ modern machinery it will be seen that a considerable length of paper is virtually wasted before the pulp feeding devices have been properly regulated. The paper

sheet should be fed more or less pulp. There is therefore no necessity of completing the drying and calendering of the paper and thus losing the paper which has passed the base roll.

By loosening the nuts 13 the standard 9 may be turned so as to face in any direction so as to be read from different parts of the room. The provision of the turn buckles 14 permits an accurate adjustment of the roller 16 so as to permit the axis 16x of the roller

to remain parallel with the axis of the base roll 1 even if the face of the guage should be turned at an angle.

The guages may be shifted along the slot 7x so that any particular portion of the sheet may be guaged. The guage members may be quickly removed or replaced. It will be noted that a very slight movement of the roller will be multiplied by the gearing so that a variation as small as 1-10,000 of an inch may be accurately registered.

The Compression and Density of Raw Materials Used in the Manufacture of Paper

By **CLAYTON BEADLE** and **HENRY P. STEVENS.**

Wood, in point of quantity, is the chief source of raw material for the manufacture of paper. Certain countries, like Scandinavia, Russia, Finland, Germany, Canada, United States, are big pulp producing countries, and what they do not require for their own use they export. Other countries, such as Great Britain and parts of the British Empire other than Canada, France, Italy, Spain, Austria, China, and Japan, which are big paper making countries, depend on outside sources of supply of wood pulp. As supplies from such countries come from long distances over the seas, freight is a matter of great importance. The freight is largely determined by bulk, and therefore the question of density, not only of bales of wood-pulp but also other forms of paper making raw materials, is of very great importance. There are several fibres that would be worth while considering as raw materials in the manufacture of paper if it were not for their excessive bulk, which would put such a freight upon them as to render the cost of delivery into this and other importing countries prohibitive, in spite of the fact that such materials may be had for the asking in the localities where they grow. Straw as raw material in the manufacture of pulp and paper has been killed in this way in England. Esparto, which is a somewhat bulky material, has the compensation of cheap back freight from the shores of the Mediterranean.

The question of bulk in the natural state of growth or gathering is of secondary importance, provided that a high density by compression can be obtained at a reasonable cost. The object of this communication is to show what densities are commercially obtainable with a few of the paper making raw materials.

Table A.—Density Equivalents.

Cubic ft. per ton.	Lbs. per cu. ft.	Sp. gr. (water=1.00)
23.8	93.7	1.500
25	89.6	1.433
30	74.7	1.195
35	64.0	1.024
40	56.0	0.896
45	49.6	0.796
50	44.8	0.717
60	37.3	0.597
70	32.0	0.512
80	28.0	0.448
90	24.9	0.398
100	22.4	0.358
110	20.4	0.326
120	18.7	0.300

130	17.2	0.275
140	16.0	0.256
150	15.0	0.240
200	11.2	0.179
250	9.0	0.143
300	7.5	0.120
350	6.4	0.102
400	5.6	0.090

Table A gives equivalents in cubic feet per ton and pounds per cubic feet, and density or specific gravity (water = 1.00). This table will be found useful for reference when considering the subject generally. As cellulose and vegetable fibres generally, as used or available for use in the manufacture of paper, possesses a specific gravity of 1.500, or a figure very closely approximating thereto, any cellulosic material compressed to its final condition so as to eliminate all air space would have a gravity of 1.500 and would weigh 3.7 lbs. to the cubic foot = 23.8 cubic feet per ton. This figure is inserted at the top of Table A in order to see how nearly highly compressed bales approach to the ultimate condition of compactness, and by the aid of such figures it is easy to calculate from any density obtained by hydraulic pressing the percentage by volume of air space and fibre. Compression of this order, i.e., approaching the complete elimination of air space, is brought about when paper is highly compressed for coverings of calender bowls, or for structural work, as for the interiors of railway waggon wheels; but this compression is never quite to the extent of eliminating the whole of the air space.

In practice, for the baling of raw material to be used in the manufacture of paper, the extent of compression is limited (a) by the cost of compression, (b) by the condition of the material when compressed, and (c) the question of deadweight. Heavy compression within limits can be brought about at a reasonable cost per ton, but the first cost of installation is greatly augmented if high compression is to be resorted to. High compression cannot be done cheaply unless operated on an extensive scale, and the hydraulic presses are heavy, but it is a comparatively easy thing to give a medium compression such as 20 to 25 lbs. per cubic foot, even by hand or horse labor and with comparatively inexpensive light and portable presses. Then, again, the compression must not be carried to the extent of destroying or damaging the paper making qualities of the raw material. High compression with some materials is very detrimental on account of the breaking up of the fibres during the compression. For instance, an ex-

cessively high density in the case of esparto would be destructive, and would make it very difficult to conduct the subsequent operations of opening up, dusting, etc., preparatory to boiling. There is a limitation here in the amount of compression, which is of necessity much less than in the case of chemical or mechanical wood pulp; but with cotton-seed cotton, which is discharged direct from the bales into the boiler, high compression such as can be obtained by the most powerful hydraulic presses is, in our opinion, of no detriment provided that the material is sufficiently broken up to ensure the complete penetration and circulation of liquor during the process of boiling. The same may be said of *Hedychium coronarium*, and, as will be hereafter seen, this fibre is capable of very high compression without destroying or impairing its paper making qualities. Table A ranges from completely compressed cellulose materials to materials in a loose unbaled or piled up condition.

The third limitation point in regard to compression, namely, deadweight, must not be lost sight of. Since deadweight comes in at 40 cubic feet per ton (= 56 lbs. per cubic foot), there is no use compressing beyond this point unless it be, perhaps, for land transport and storage in warehouse and factory.

Table B.—Comparative Densities of Different Raw Materials used in the Manufacture of Paper.

	Cubic ft. Lbs. per per ton. cubic ft.	
Esparto bales.	120	18.7
Do. Hydraulic press	90	24.9
Moist "mechanical" wood-pulp (50 per cent water.	44	51
Do. mean	36	61
Do. Equivalent dry weight	40	56
Moist "mechanical" wood-pulp (50 per cent water.	80	28
Do. Equivalent dry weight	40-45	56-50
Chemical wood-pulp (sulphite), ord- inary compression, air dry	80-90	28-25
Best practice for sulphite, air dry..	65	34
Chemical wood (soda) kraft, dry . .	50	45
Chemical wood-pulp (sulphite), dry) by measurement and weight of	80	28
bales in mills.	61.6	36.4
Do. Mean	54	41.5
Hedychium coronarium, continuous light baling press	57.8	39
Do. "Heavy"	90	25
Do. Heavy hydraulic presses. . .	64-56	35-40
Do. Greatest compression obtained with bales (dry)	37-38	60-61
Do. (Wet)	33-34	66.0
	33-34	66.8

Table B. shows a comparison of densities of different paper making materials. It will be noticed that the bulkiest material is esparto. Moist mechanical wood-pulp reaches deadweight, but inasmuch as it contains 50 per cent of water a dry ton has a volume of 80 to 90 cubic feet. Serious attempts have been made in modern pulp mills to compress to 40 per cent of moisture, but it is doubtful whether this will be accomplished economically. There appears to be a greater uniformity of compression in the case of "mechanical" than with "chemical" wood-pulp. This may be due to the fact that in the case of mechanical a definite amount of moisture is aimed at, namely, 50 per cent, and this is regulated by the amount of compression. There is also the important difference that mechanical is pressed moist and chemical compressed dry. "Soda" or sul-

phate pulp, as might be expected, gives less compression than sulphite; the sheets of sulphite are made compact before baling, but the amount of compression, whether for chemical or mechanical, varies with different mills, according to the power installation and the qualities of the pulp-wood as well as the wood-pulp operated upon. There is a great difference in the qualities of "sulphite" and "soda," one being much harder than the other, and mechanical varies very much in its qualities according to the sources of supply, the mode of grinding, and so forth. The mean results for moist mechanical, taken by us from different sources, show practically the same figures, i.e., 40 cubic feet per moist ton = 56 moist pounds per cubic foot, which is deadweight. The first figures given for moist mechanical show how the density varies between individual bales, the second figures were arrived at from measurements made in bulk.

Hedychium baling was tested first of all in continuous light baling presses. The Hedychium operated upon was in the condition as shipped from Brazil, i.e., after passing through crushing rolls and drying prior to shipping, that is in the form of a loose tow. Hedychium as piled or packed loose has a density of about 5 lbs. to the cubic foot. On packing into digesters it will occupy about 10 lbs. per cubic foot. With Howard's Dreadnought heavy continuous presses it gives bales of a density of from 35 to 40 lbs. per cubic foot; with lighter presses of the same type 25 to 30 lbs. per cubic foot. Either the light continuous or heavy Dreadnought presses will bale material at the rate of 20 tons dry weight per diem. For greater densities it is advisable to employ hydraulic pressure. With heavy compressions with hydraulic presses 60 lbs. per cubic foot is obtainable, which is more than is necessary for deadweight. In order to see what was the greatest density obtained with Hedychium, pressures of over 1 ton per square inch were employed on small bales at the works of Messrs. Howard and Sons. The highest compression for dry Hedychium in the form of bales was 66 dry lbs. per cubic foot. This compression is not detrimental to the qualities of the product. In this condition of baling it can be used for the manufacture of paper, and without these qualities having been impaired as the result of high compression. For moist Hedychium we obtained bales containing 66.8 moist lbs. per cubic foot.

Table C.—Laboratory Baling Tests with Hedychium.

	Grms. Lbs. per per cu. cub. ft.	
Raw dry Hedychium, pressed in Cider Press—		
Packed before pressing.	0.089	4.4
Do. Whilst under pressure	0.355	17.6
Boiled Hedychium, pressed in Cider Press—		
Gross weight (68 p.c. moisture) . . .	1.20	75.0
Equivalent dry weight	0.385	24.0
Baling in iron cylinder—		
Raw dry, under pressure	1.24	77.5
Do. Pressure released	1.00	62.5
Raw wet (47 p.c. moisture), under pressure. Dry weight	1.00	62.5
Do. Pressure released. Dry weight.	0.71	44.4
Ordinary pressing without a "former"—		
Gross weight (55 p.c. moisture) . . .	1.00	62.5
Equivalent dry weight	0.45	28.2
Gross weight (42 per cent moisture). .	1.20	75.0
Equivalent dry weight	0.695	43.5

Table C. gives some experimental baling with Hedy-chium where the density is expressed in grms. per cc. and lbs. per cubic foot. This gives one some idea of the amount of diminution of volume during the process of baling. In practice the reduction in volume is considerable, one ton dry weight uncompressed occupying over 400 cubic feet, after compression less than 40, that is it reduces to about one-tenth. A continuous baling press, by producing bales of a density of 25-30 lbs. to the cubic foot, is well adapted to this work as a first operation. The next operation is best done by compressing two bales into one to a density of 60 lbs. to the cubic foot prior to shipment. The laboratory results obtained with cider presses in light compressions seem to indicate that greater dry weight per cubic foot can be obtained if the material is compressed in a moist rather than a dry condition. This is due to the material becoming more yielding to the pressure when moist than when dry, but when heavier pressures are employed the moisture taken up by the fibre causes it to swell somewhat and to offer a barrier to anything like complete compression, so that the reverse is the case, namely, for high densities the dry goes closer than the moist. Thus 77 lbs. per cubic foot, before releasing from the presses, has been actually obtained in making dry compressions; this expands to 62 lbs. to the cubic foot when the pressure is released, but when the moist material, containing about its own weight of water, is similarly treated in iron cylinders, the density under full compression is 66 and when released 44 dry lbs. per cubic foot. The same is to be noticed when baling under hydraulic pressure recorded in Table B. In the case of the hydraulic pressed bales we obtained 66.0 dry lbs. from the dry pressing and 66.8 moist lbs. per cubic foot from the moist materials after release from pressure. Unfortunately we did not take note at the time of the dry weight in the wet baling, but we have since dried out the bale and find that it had a density of 38 dry lbs per cubic foot under equal pressure with the former.

The conclusion is, therefore, that for moderate pressures and density, a greater dry weight per cubic foot is to be obtained baling moist than when baling dry, but that with hydraulic pressure for high densities, i.e., in the neighborhood of dead weight, the greater dry density is obtained by baling air dry or in the neighborhood of air dryness.

SWEDISH WOOD PULP TRADE.

Before the outbreak of war "Affarsvarlden," the trade journal of Sweden, had the following to say about the condition of its wood pulp trade:—

Mechanical Pulp.—The heavy drought now begins to make itself very much felt at the wood-pulp mills especially in central Sweden. According to what we have learned, about 10 mills have already nearly stopped work altogether owing to water-famine, and an equally large number of mills are for the same reason running with $\frac{1}{2}$ or $\frac{3}{4}$ power.

The state of prices is therefore firm with a rising tendency, but the turn-over is quite significant.

Chemical Pulp.—The sales have been more lively lately, and it is especially the American paper-makers that have been in the market. Quite a large contract in strong sulphite has been closed at a price, corresponding to £7 12s 6d f.o.b. including broker's commission and discount; also for easy-bleaching sulphite a couple of big sales of £8 10s f.o.b. have been closed.

The sulphate market on the contrary has been very quiet during the last weeks with unchanged prices.

FOREST PROTECTION PROPAGANDA.

The Forest Branch, Lands Department, British Columbia, has designed a pocket whetstone with a celluloid back, for distribution among the Boy Scouts of the Pacific Province. On the celluloid appears the legend—

Build Camp Fires in Safe Places
When You Leave, Put Them Out
Boy Scouts, Be Prepared
Help Protect Our Forests

Chief Forester MacMillan writes to the Scout Masters:—

"Altogether 1,000 of these Boy Scout stones are being sent to the Scout Masters of the Province. 10,000 pocket whetstones like these, but bearing a different inscription, and thousands of posters, pictures and circulars have been distributed also by the Forest Branch to the general public.

Our forests form the most valuable resource owned by the Province. They are its greatest single source of revenue—a revenue which helps build our roads, bridges, schools and other public works—a revenue in which every citizen shares. Their conservation is an object well worthy the aid of the Boy Scouts. You may be assured your co-operation will be appreciated."

To Pulp and Paper Magazine, Mr. MacMillan says:

"This is part of a systematic campaign for forest fire protection which the Forest Branch is conducting. Altogether over 50,000 circulars, posters, pictures, pocket whetstones, etc., have been distributed all over the Province to lumbermen, woodsmen of all kinds, newspapers, banks, hotels, stores, clergymen, school children, etc. The response has been very gratifying.

"The latest, and I believe, one of the most effective moves in the campaign is to reach the people by means of the moving picture theatres. A number of educational slides have been designed, and will be shown at practically every moving picture theatre in the Province, through co-operation with the proprietors."

SUPERINTENDENT HONORED.

On July 25, a reception was tendered to Mr. W. D. Gregoir, former mill manager of Price Bros. and Co., Ltd., by the employees, in honor of his departure. Mr. and Mrs. Gregoire were the recipients of a beautiful silver tea set, while a handsome travelling bag was the individual gift to Mr. Gregoir.

Superintendent Grieg made the presentation speech, which expressed the regret of the employees of the company at losing a man so fully appreciated by all.

Mr. Gregoir's reply was full of praise and good fellowship for the men who have worked with him during the period of his stay in Kenogami. A buffet lunch and entertainment was enjoyed to the fullest extent by those present.

Ger. Gregoir will make his home in Montreal for the time present.

The Terry Steam Turbine Co., builders of steam turbines, for all purposes, main office and works, Hartford, Conn., announce that they have appointed Fid-anque and Sons, of New York and Panama, with main office at 15 Whitehall Street, New York, as representatives for the Republic of Panama and the Canal Zone. Also that on August 1 their Cleveland office, in charge of Mr. L. G. Finlay, will be moved from its present location, 710 New England Building, to 503 Union Building.

UNITED STATES NOTES

Mill 5 of the Union Bag and Paper Company's plant has resumed operations at Glen Falls, N.Y., under full head, placing more than twenty-five men to work who have been unemployed for more than three weeks. With the aid of an electric motor, together with the water power realized from the coffer dam recently erected, it was found possible to start up the paper machines immediately. The Fenimore plant of the Union Bag and Paper Company, beginning last week, will be operated on full time. For a number of weeks the mill has closed down Saturday morning, to resume operations Monday.

Increased orders and brighter prospects for business have caused the company to take this step. The dull times for the Union Bag Company are apparently disappearing like dew before the morning sun. The bag and printing departments are being run to capacity.

* * *

Application was made in federal court at Fort Wayne, Ind., last week by creditors of the Elkhart Paper Company of Elkhart, for the appointment of a receiver for that concern, which is alleged to be unable to pay its debts. The concern is capitalized at \$300,000, and is said to have assets of \$800,000. An over-expansion of business is said to be the cause of the trouble. Upon instructions from Judge Anderson, Commissioner Logan referred the matter to Judge Sol Wood, referee in bankruptcy. A subsequent meeting was held in Judge Wood's office and Glenn R. Sawyer and A. A. Wheat, both of Elkhart, were named as receivers and they were given authority to continue to operate the plant. The petition was filed by the Central Manufacturing Company of Kalamazoo, the Chicago Fuse Company, American Spiral Pipe Works and others. They allege that the company is in debt in excess of \$300,000 in open accounts and \$250,000 bonded indebtedness. Assets include \$60,000 worth of stock and products.

* * *

A new concrete dam, which will be about 300 feet in length and 15 feet in height, increasing the power at the mill of the Taggart Paper Co., at Great Bend, N.Y., will be started within a few days and rushed to completion this season. The plans for the improvement were made by J. M. Baldwin, the engineer for the St. Regis and Taggart's paper companies, and the contract has been awarded to the Stewart Engineering and Construction Co., of New York, which constructed a large dam for the St. Regis Paper Co. about a year ago. The new dam will cost several thousand dollars, and will be of a distinctly modern type. Under the contract it will be completed in five weeks, making it necessary to close the mill only for that length of time. The mill was shut down last Monday, and no other improvements are now contemplated. The height of the dam will be about one foot more than the present one.

* * *

Clare S. Miller, of Holyoke, Mass., for the past three months assistant superintendent of the Albion division of the American Writing Paper Company, and previous to that time superintendent of the gill division of the company, resigned several weeks ago. Mr. Miller suc-

ceeded G. Obermann, who resigned and left later for a trip to Europe. It is understood that Mr. Miller will leave for the West in a short time. A. C. Gault, 38 Taylor street, business manager of the Albion division, will be Mr. Miller's successor. He has been connected with the company for many years and previous to going to the Albion mill he was manager in the general offices of the company in Main street.

* * *

By a decision handed down by Judge A. H. Reid of Nausau, Wis., Eau Claire is the loser in the famous Dells dam case brought by the Dells Improvement Company and the Dells Paper and Pulp Company of that city. The litigation, which had been hanging fire in the courts since 1906, involved rights and privileges to the Dells dam, which was built by the city in 1877, and leased to the plaintiffs for ninety-nine years for \$1 a year. The city assailed the contract, contending it invalid and an abuse of discretionary powers of the city. The city also contended that the Dells people had violated certain provisions of the contract.

* * *

Charles N. Bulger, of Oswego, N.Y., and David F. Costello, trustees of the Battle Island Paper Company of Fulton; Gay Daley, Chairman of the Bondholders' Protective Committee, and William P. Gannon, attorney, left Syracuse last week for Montreal, where they will confer with the liquidators and inspectors of the bankrupt company's Canadian property. The third trustee, Nelson P. Bonney, of Norwich, Conn., probably will join the party later. The conference, which may last for several days, will concern the future of 110,000 acres of timber land in the province of Quebec, which is an important item in the bankrupt's estate. It is understood that the property, which includes a rossing mill, has been appraised at \$385,000.

* * *

The International Paper Company of 30 Broad street, N.Y., reports that business is running at about 90 per cent. of its normal rate. This is sufficient to insure the earning of a small margin above the 2 per cent. preferred stock dividends. Last year the company showed 4½ per cent. on its preferred shares, ordinarily the consumption of newsprint increases between 7 per cent. and 8 per cent. annually, but owing to depressed trade conditions at present, the output and consumption this year has failed to maintain its usual gain. This situation, however, has been greatly changed since the increased business during the past two weeks will undoubtedly make a decided improvement in the earnings of the company.

* * *

Work is progressing rapidly on the Badger Paper Bag factory, located one block south of the street car barns at Nausau, Wis. The steel frame-work is up and the steel cross-beams are being laid. The first story is going up quickly in brick and tile. The two upper stories are also outlined in steel. When this structure is completed it will be the most substantial buildings of the kind in Nausau. The promoters of this establishment are men of wealth and energy and when they take hold of an enterprise it is bound to be a success.

The work of placing the new machinery will begin as soon as the roof is on and by about September 1st the factory will be ready for operation.

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Proposed increases in rates on paper of various kinds in less than carload lots from points in New England on the New York, New Haven and Hartford, Boston & Maine, and Boston & Albany roads to New York City and other points were suspended last week by the Interstate Commerce Commission until Nov. 25. On the first two named roads the increase would have become effective July 28, on the Boston & Albany on Aug. 18.

* * * *

The York Haven Paper Co., of York Haven, Pa., has recently installed a Stanley inductor type 350-k.w. 3 phase 60 cycle generator at 220 volts' pressure. This company's plant is now equipped with 30 motors, all three phase. The largest is 50 h.p. There are about 500 incandescent lamps and 8 General Electric flaming are lamps for yard lighting.

* * * *

The Cornell Paper Products Company is the name of a new corporation, capitalized for \$3,500,000, which takes over the holdings of the bankrupt firm, the Brunet Falls Manufacturing Company, of Cornell, Chippewa County, Wis. The property consists mainly of a paper and pulp mill, with extensive water power at Cornell. The plant was erected several years ago. The Ule Construction Company, of Stevens Point, Wis., having done a part of the construction work. The incorporators of the new company are: Rufus B. Smith, N. R. Curkell and R. M. Stroud, all residents of Wisconsin.

* * * *

The Wolf River Paper Mills at Shawans, Wis., is making improvements all the time and have a very complete plant. They recently installed a five-ton digester, which is double of their other two. They are now making new tanks for the sulphite tower, and also making other improvements. They have a good demand for their product, which is considered among the best made.

* * * *

The English Fibre Board Company, which recently took over the old Shutts' mills at Penn Yan, N. Y., is now producing high grade board, such as press, leather fender, chair seating, etc. The company bought the old mill and remodeled it complete, equipping it with the best machinery to produce the highest class of press board made, and the product is the highest class of press board made. This mill is equipped according to the English ideas and is operated by English workmen. This, together with the latest style machinery, will enable it to make as good if not better board than produced even in England.

* * * *

The Western Paper Dealers' Association held a meeting at Grand Pacific Hotel last week. The meeting was held for a special purpose, but beyond this fact and a statement that the purpose of the meeting was accomplished, no information concerning the proceedings could be obtained. As a rule, the Association meets only in the latter part of the year. The calling of the special meeting was not generally known and the paper men came and went without disclosing the nature of the subject which had occasioned the special gathering.

* * * *

Within a month the J. B. Wise power plant at Watertown, N.Y., will be finished opening up what is said to be the largest plant of its kind east of the Mississippi

River. The building will be of concrete, 162 by 40 feet, with a height of ninety feet from the bottom of the draught tubes to the top of the roof. Six draught tubes will open into the head of the river from the base of the building. These tubes are horizontal and designed to obtain the maximum efficiency. The power will be developed through generators 19 feet in diameter. Each generator together with its water wheel will weigh 100 tons. The dam at this point is 210 feet wide. Of the 3,000 horse power developed, 600 h.p. will be used at the J. B. Wise plant and the rest will probably be distributed to the other enterprises in the section.

* * * *

The war in Europe will in all probability have a decided effect upon the China Clay situation in this country, but what it will be remains to be seen at present. Importations at Portland, Boston and New York will be decidedly curtailed for some time to come, and supplies on hand at present are reported to be comparatively light. The leading importers in these cities have had innumerable requests of late for additional supplies, and many say they will only be too willing to construct additional bins or pay extra storage if they can only secure sufficient quantities to tide them over for the next six months. Coating paper manufacturers in particular are very anxious, and it is the consensus of opinion that many of them will have to resort to substitutes before long. Hammil and Gillespies, the leading importers in New York, stated to your correspondent last week that they had orders on hand for more China Clay than they could fill, and that shipments on the way to them at present were comparatively light. This certainly indicates that the market for this item will be very strong so long as the war in Europe prevails. As far as prices are concerned, though, no advance has as yet been reported and it is quite evident that the commodity will rule at very high levels.

* * * *

Advices from Maine state that Austria, Servia and Russia may draw upon workmen in this country to participate in the war abroad. If such is the case the paper mills in Maine would be seriously effected, as quite a few of the foreigners are employed in the forests in that State. Already quite a number of the foreigners have left their positions and made for the nearest seaport in the hope of booking for their respective countries. As far as drafting is concerned, however, it is not likely that Uncle Sam will permit any aliens to leave this country without their consent.

* * * *

On August 1 in the United States District Court at Dayton, Ohio, was filed an answer to the petition in bankruptcy instituted by Jacob Hyman and others, denying the insolvency and acts of bankruptcy charged against the Sterling Paper Company of Hamilton. District Attorney L. W. James, of Hamilton, represented the purchasers of the plant (C. F. Berely and Alfred A. Srere). It is admitted that payments were made to the Anderson & Shafer Company on March 14 and May 29, 1914, respectively, but that they were made with intent to prefer this company as a creditor, or that the Sterling Paper Company was insolvent at the time, is denied. The court is requested to inquire into the matter.

The assets of the company are estimated at \$300,000 and the liabilities at \$200,000. The president of the Sterling Company is J. Howard Friend, for many years the head of the Friend Paper Company, at West Carrollton, but who, since the reorganization of that concern, has been located in Dayton, where the offices of the Sterling Paper Company are located. The plant

is located in Hamilton and is one of the best equipped of its kind in the country. While heavy losses were sustained during the 1913 flood, and it was necessary to go over much of the improvement work which was in progress in the mill at the time, it appeared to be weathering the storm in good shape. The depression in trade had its effect, however, on the company, but, according to its allegations, it is far from insolvent, the assets being approximately \$100,000 in excess of the reported liabilities.

Plans have been practically completed for the reorganization of the Sterling Paper Company. The formal reorganization will probably occur during the week when a meeting of the new owners will take place. It is planned to issue new stock, but in just what amount has not been definitely decided.

At least \$100,000 will be expended in installing new machinery and in the erection of new buildings. When completed, the plant will be one of the largest and one of the best equipped in the State. It is proposed to incorporate the company under the name of the Hamilton Paper Mills Company, so it is stated.

* * * *

Dispatches from Philadelphia tell of a dearth of raw materials for paper making uses, and one of the leading trade journals state that while war has not so far directly affected the trade, Philadelphia paper makers believe it will not be long before prices must go up as a direct result of the restricted supply of those essentials which come from abroad. They take the view that paper makers are always the very last to advance prices, but that the necessities of the present case soon will make it impossible for them to continue at present rates.

Vast quantities of sulphite are imported from Germany, and this supply will of course be shut off. Large supplies of cheap rags also are imported from Germany and Italy, and if this is cut off recourse will have to be taken to domestic stock, with a consequent increase of price through competition for a supply not adequate to demands. Finally and most important of all, there is now shipped from Fowey, in the west of England, Cornwall clay used in making supercoated and calendered paper, and since there is said not to be in this country a clay supply which will replace the foreign, the makers of the higher grades of paper fear a restricted if not an entirely suspended supply. From Germany and elsewhere abroad are now received various other raw materials, chemicals and other dyestuffs, but the restriction of these is not looked upon as very important. The net result, however, they say, will be curtailed supply and advanced prices.

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The first crew to engage in lumbering in the Maine woods for the season of 1914-1915 left Bangor last week for Phillips, where operations will be carried on by F. J. Barnjum, the largest individual timberland owner in New England. From now on crews will be sent to the woods at varying intervals until next March. Before the days of railroads into the heart of the forests, it was unheard of to see crews starting out before snow fall, but with the advance of civilization and the constant supply of pulpwood, especially now at this critical period, it has been found necessary to make earlier starts.

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In speaking of the effects the war in Europe will have upon the wire cloth manufacturers in this country, an authority this week stated that it's an ill wind that blows nobody good. "That maxim is applicable

in the case of the American wire cloth manufacturers, especially those in the Middle West, when thought turns to the European situation. Ever since the new tariff law became effective, western wire cloth men have suffered a decline in business as a result of the invasion of German-made wires. The present situation in Europe generally will at least result in the temporary interruption of shipping of German wires into this country. Uncle Sam's paper mills will keep on grinding away and will have to use wires, but they won't be foreign made. Western wire works have been running on a 50 per cent. basis for months. It is probable the present situation will make it possible to resume the former 'rush' conditions."

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Workmen have practically cleared away all of the debris where the plant of the Niles Board and Paper Company stood, at Niles, Mich. The fire made a clean sweep of the whole building, leaving practically nothing that can ever be used again. There are many thousand pounds of junk and rubbish to be disposed of, and officials of the company are now planning the construction of a new mill on the site of the one recently burned.

* * * *

Arthur C. Hastings, the newly appointed President of the American Writing Paper Co., this week signed a lease for a number of years on the C. B. Prescott house on Linden street, in Holyoke. Since his appointment to the presidency of the A. W. P. Co., Mr. Hastings, who has heretofore maintained his residence in New York City, has been undecided as to whether he would take his family to Springfield or Holyoke. Advantages of the latter city caused him to secure the above place.

EMPLOYMENT OF PYRITES INSTEAD OF SULPHUR IN CHEMICAL-PULP MILLS.

Almost all large European chemical-pulp mills have changed over from burning sulphur to roasting pyrites: mills in America and Canada for the most part still use sulphur. When pyrites is employed a saving of 11.35 dollars per 1,000 kg. sulphur is obtained. Pyrites having only 45 per cent. sulphur cannot be rationally roasted at once, because the percentage of iron suffices for using it further in blast-furnaces. Pyrites having only 35 per cent. sulphur cannot be rationally worked up on account of its small percentage of iron. If the purple ore contains copper, however, pyrites having 35 per cent sulphur can also be advantageously employed.

According to a new process by Buddens a percentage of 0.8—1 per cent copper in the purple ore suffices for enabling this to be rationally worked up further on the spot into copper and then into iron. According to this process the calcined pyrites are chlorinized with compressed air, without employing carbon, solely with the small percentage of sulphur amounting to 2 per cent and roasted, and then all the copper with the exception of 1 per cent is recovered from the purple ore. The process is also suitable for small quantities of calcined ore, e.g. about 20 t. per day. The Buddens kiln is made entirely of cast-iron and is ready for working in 10 minutes; it can therefore be worked intermittently. The cost of working up 1 ton of purple ore is about 2.0—2.5 dollars including amortisation, lixiviation and recovering the copper. Any silver contained in the purple ore is recovered with the copper. Several large chemical-pulp mills in Europe work on the Buddens process.—Der Papier Fabrikant.

Ottawa Notes

Ottawa, Ont., August 10.—The cut of timber and of pulpwood in the Ottawa Valley next season will be considerably decreased as a result of the war. The advance in the price of food and the increased cost of horses will be largely responsible for this. The J. R. Booth Company had figured on sending about 4,000 men to the woods this year, but as a result of the outbreak of hostilities and its expected effect on prices will send in only about 1,000. Other companies state they will follow suit in this regard so that next year's cut will probably fall far short of previous figures. For various reasons, too, the cut of the present season will be smaller than expected. The J. R. Booth Company was tied up for over a month as a result of the breaking of a flume wall, and the Shepard and Morse Lumber Company has had its plant disorganized as the result of an accident to the machinery last week. Then the Gilmour and Hughson Company of Hull over a week ago lost \$200,000 worth of lumber in its yards as the result of an outbreak of fire. Much of this was pulpwood, the company states, mostly spruce logs.

When to these factors is added the record low level of the Ottawa river it will be seen that the present supply of pulpwood in the Ottawa Valley will not by any means be large. However, it will probably be large enough to meet the demands for the raw material since the war situation, while it will boost the demand for news print, is expected to injuriously affect other branches of the paper trade. That, at least is the opinion of Ottawa Valley mill owners. Up to the declaration of war the paper business locally had been showing improvement. In a statement issued last week Mr. W. H. Rowley, general manager of the E. B. Eddy Company of Hull had stated that there was an increased demand for wrapping paper and paper bags, in spite of alleged trade slackening, and the company's mills had been running continuously at full time. Now, however, this is expected to fall off though, as already stated, the number of newspaper extra editions being issued all over Canada will call for a larger production of news print.

The paper mills of the J. R. Booth Company, which were put out of operation as the result of the breaking of a flume wall at the plant over a month ago, commenced operating once more within the past two weeks, and the two pulp mills which also had to be closed down, are now making up for lost time. Within another month the new addition to the present sulphite mill which has been in course of erection for some time will be ready for operation. It will add fifty tons to the present capacity of the plant.

The much dreaded forest fire which has been smoldering throughout New Ontario, has at last broken out in many parts of the North Country, are in danger, according to a statement made to your correspondent by Mr. Martin Childerhose, editor of the Cobalt Nugget. Already many square miles of the best timber and pulpwood, of which there is so much in Northern Ontario, have been burned down. The big lumber mill at Earleton, Ont., was destroyed last week with 200,000 feet of sawn lumber and a quantity of logs, which were designed for pulpwood, all of which timber was owned by Mr. W. J. Booth. According to late advices, South Porcupine was in danger of being wiped out, while the buildings of a number of mines have been destroyed. The fires are not entirely unwelcome to the settlers as they are a ready agent for clearing his

land, but they are viewed with alarm by the timber owner, not only for the damage they do to mills and cut timber, but to the productive areas of forest land which they render barren.

The big Temiskaming dam which gave way about two months ago, and allowed a huge volume of water to sweep down the Ottawa River, has been repaired again and is doing its work of conservation. In spite of this, however, the water in the Ottawa River as well as in the Gatineau, is of record lowness, and is dropping steadily all the time. It is feared that power users at the Chaudiere will have to curtail their requirements this fall.

The E. B. Eddy Company has set a patriotic example to other pulp and paper firms by instituting a war fund similar to that raised by the same company during the South African War. According to Mr. W. H. Rowley, general manager, the fund will be raised by means of a special tax on the sulphur and the matches which the firm manufactures. Besides this, the firm has notified all of its employees that any who may wish to volunteer for active service with the Canadian contingent will have their positions kept open for them until they return. The company will also endeavor to alleviate the sufferings of those who are wounded, when they return from the front.

MAC.

The Proper Storing of Paper

By WILLIAM T. REID.

(Written Specially for Pulp and Paper Magazine).

In these days of "Express" and "Rush" orders comparatively little consideration is given by the Paper Dealer to a matter that should be an important feature of his business, viz.: The proper storing of paper. At first sight this commonplace essential seems to be of such trivial account that it gets but little attention from the busy warehouseman, who in many cases is sorely tried to find space in his shelves for the ever-increasing variety of new papers being pushed on the market.

The following notes of advice—if they can be so termed—contained in this short article, are by no means intended for the instruction of the paper mills superintendent or his storeman, but rather for the guidance of the paper-dealer and his young assistants on the flats. The storing of paper at the mills is carried out under scientific principles and well thought out methods.

On the other hand, it may not be taken amiss by the paper mill superintendent to hear a word from the paper dealer's man, who too often receives shipments of immatured paper, particularly cheap bonds, printings and common writings, which has not been "stalked" for any time at all, but cut, counted and wrapped immediately the paper has been finished. Too new papers are a continual source of worry and vexation to the color printer and lithographer, more especially when the printing is done on a rapid running machine. Complaints from the printer on this score invariably reach the ears of the dealer and sometimes in rather forcible language, of which the paper maker's finishing superintendent has not the remotest idea. The management of every paper warehouse has its own ideas and methods of carrying out his special branch of work, while a variety of opinions will have their own special merits. There are, however, certain methods, when properly carried out will help to build up the reputation

and good name of a paper warehouse far beyond the efforts of the most persisting advertising.

To please the printer and receive his trade, papers and boards must be delivered to him in a clean, well wrapped and presentable manner. No more trying or exasperating experience can be given to a printer than to send him, say 20 to 30 sheets of a Superfine Ivory Bristol rolled up as tight as a quarter ream of M. G. Tissue. Papers and boards should be stored in a clean, dry, well lighted, ventilated warehouse and kept as free from dust as possible. Damp floors or walls should be carefully avoided, as the absorption of moisture by engine-sized and ordinary printing papers is rather high. So far as possible, fairly large orders should be delivered to the printer in case lots, as this enables the consumer getting his printed forms all the same shade, texture and finish of paper. Care should be taken by the storeman when putting into stock a case of paper to clear out what remains of a former case and place it on top of the new lot to ensure it being sold out before beginning on the newer stock. In as far as it is possible and practical, warehousemen should be careful to fill their orders from the one making, as a new making invariably differs in some slight degree in texture, shade or finish to a former making.

The question of temperature should be carefully watched more especially in mid-winter. No warehouse carrying stock for printers or lithographers should be allowed to get under 56 deg. and should not exceed 76 deg. Papers and boards get easily chilled in transit from the store to the printing office. Papers thus chilled and rushed into a printer's press room, where the temperature is often as high as 76 deg. to 80 deg., naturally undergo a change; they invariably begin to warp and sometimes cockle. Such papers are then unsuitable for exact register work if printed in the full sheet on rapid printing or lithographing machines. The printer is then apt to blame the paper. He should rather locate the blame with the inconsiderate paper warehouseman who, either from want of thought or over anxiety to rush the order, omitted to instruct the driver to cover up the reams while on his truck or van to the printer.

Colored and tinted papers should be stored away from the immediate rays of the sun, as a bright light will often affect the color, even though the paper is fairly well wrapped, if it lies for any length of time facing the sun. Special care should be taken with piling colored papers in stock to ensure filling of orders from all the one making, this being a comparatively easy task, as many of these papers have the making order number stamped on the reams, thus ensuring the consumer of a supply of all the same shade.

Coated papers require a great deal of care in handling to ensure no loss on them by the dealer. Lapping these papers the long way—half ream within half ream—is an inexpensive and satisfactory way of shipping the lighter weights of Coated Litho. and Coated Book. The heavy weights are more satisfactorily delivered in crates, laid flat and the edges protected by woodboard or strawboard from the rope or cord injuring the paper. Coated papers going any distance by rail should invariably be eased and well packed to ensure the printer receiving same in good order, as this particular class of paper is very much inclined to slip and break even in the case.

Stated rules and exact methods, however good or well laid down for the better working of paper warehouses, are after all only of value when reasonably applied in a commonsense way.

Badger Bag and Paper Co.

(Special to Pulp and Paper Magazine.)

Wausau, Wis., August 12.—The Badger Bag and Paper Co. has been organized, as previously published in *The Pulp and Paper Magazine*, under the laws of the State of Wisconsin, with a paid-up capital of \$250,000.00, to manufacture paper bags, and will be located in this city. The building is now nearing completion, and it is hoped to set up the machinery and start operation by the latter part of September.

The officers of the company are as follows:—W. L. Edmonds, President and General Manager; A. Pareira, Vice-President and Manager of Sales; Walter Alexander, Treasurer; C. C. Yawkey, Secretary. The directors are:—W. L. Edmonds, A. Pareira, Walter Alexander, C. C. Yawkey, Jnd. Alexander.

The general offices will be in Chicago, Ill., in charge of Mr. Pareira, with branches throughout the United States. The bag factory will be alongside of the paper mill. Due caution has been taken to have ample storage room and facilities to enable the Company to carry a large stock. Mr. Alexander is also President of the Wausau Paper Mills Co., at Brokaw, Wis. Mr. Yawkey is Vice-President, and Mr. Edmonds Secretary and Manager. Mr. Yawkey is also President of the Marathon Paper Mills, and Mr. Alexander is Vice-President of the same mill. These gentlemen, therefore, are long experienced in the paper line.

A. Pareira, Vice-President and Manager of Sales of the Badger Bag and Paper Co., is thoroughly experienced in this line, having been in the paper and bag business for a number of years, and thoroughly acquainted with the manufacturing and sales end of both wrapping paper and paper bags. The line will embrace all grades of wrapping paper and the company will also manufacture a full and complete line of felt, square, self-standing and satchel bottom grocers bags, millinery bags, nail bags, flour sacks, poultry sacks and all specialties in paper bags required by the trade. Mr. Pareira states that he is equipping a thorough printing plant, and will be in a position to furnish wrapping paper and paper bags printed or plain. From present indication the sample products will be ready to present to the trade about the first of October.

YIELD OF HEDYCHUM CORONARIUM

A great deal of interest has been aroused by statements made by Clayton Beadle and Henry P. Stevens in their various papers on the subject of *Hedychium Coronarium*. The high yield per acre has been confirmed by Government Departments in South America. They have taken upon themselves to study the question and to ascertain whether these high yields are available. The information comes from British sources through no less a personage than the Director of the Science and Agricultural Department, Georgetown, British Guiana. As the result of extensive trials and measurements, an official statement has been made that, even in dry land, a five months' crop has yielded 28 tons of green plant per acre and that the height of the plant is from 2 ft. 6 in. to 3 ft. On certain kinds of moist land the plant is found to grow with great vigour, the stems attaining a height of 6 ft. 6 in. The yield of plants of this height Messrs. Beadle and Stevens have already ascertained to be upward of 60 tons green weight per acre. It would therefore appear that the official tests more than confirm the statements already made by Messrs. Beadle and Stevens in regard to the yield per acre.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

English experts are at all times very keen on new sources for producing paper-making materials, and in this connection credit must also be given to the British paper-makers' engineers for the valuable help they give in the way of machinery and advice. The ordinary common Nettle—a plant well-known to every British school-boy for its sting—which grows in barren places and on neglected land to a height of 3 feet to 5 feet, has recently engaged the attention of experts in paper-making materials and the results have been so satisfactory that a new company is to be formed for cultivating the nettle and utilizing the fibre for various commercial purposes. Discoveries recently made show that the time will not be far distant when the Nettle will be used in the manufacture of paper. It possesses a fibre equal and better in many respects to that of Ramie, but the difficulty in the past that had to be contended with was that of degumming the fibre without injuring its tensile strength. Now this trouble has been mastered and recent experiments have shown that the Nettle contains 40 per cent of paper-making fibre. Naturally this discovery has caused a good deal of interest to be taken in the Nettle and the progress of the work to be undertaken by the newly-formed company will be keenly followed by the British mill owners.

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Sometime ago reference was made in the Pulp and Paper Magazine to the discovery that veldt grass found in South Africa could be utilized for paper-making. The chairman of the Industries Committee of the Pretoria (Transvaal) Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and the reports that had reached him say that the grass is nearly equal to Esparto. It is also stated that a capital of \$96,000 would be required to run a mill capable of producing a minimum of 15 tons of packing and coarse brown paper per week. The starting of a mill is now being advocated in Pretoria and two necessary commodities, lime and coal, are abundant in the immediate vicinity at remarkably low rates. Many paper men in Canada will be interested in the veldt grass, as esparto papers in the Dominion are mostly imported from Scotland. Esparto at the present moment is very dear, for not only prompt but distant shipments, and if veldt grass is found suitable as a substitute, the paper-making industry in Scotland will be greatly relieved.

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The Ramsbottom Paper Mill Co., in Lancashire, is again paying an interim dividend on the ordinary shares of 15 per cent. For each of the last three years the return was 20 per cent, and it is perhaps not too much to expect that the rate will be repeated for the current year, although papermaking in England has not been as profitable in England as it was some years ago. This company has a considerable income from investments in the Kellner-Partington Paper Pulp Co., which some months ago were valued at £170,437. The Kellner-Partington Company has paid 20 per cent for each of the last nine full years and its interim dividend in May last was at the same rate. It is not unlikely, therefore, that the Ramsbottom Paper Mill Co. will again be in a strong position when its accounts for the

year are made up. The North of Ireland Paper Mill Co., Ltd., which has recently introduced electricity for power and lighting at the Ballyclare mill, near Belfast, in the half-year report ended 30th June, state that considering the difficulties experienced in the past respecting the water supply and the present condition of trade, it is to the interest of the shareholders that no dividend be paid for this half-year. The profit from working accounts for the six months, amounts to £1,413, and the profit and loss account stands at £43,219. Brown, Stewart, and Co., of Glasgow, a firm established in 1892, having a capital of £100,000, report that net profits are little more than half those of last year at £4,857, but the directors are enabled to pay a full year's dividend, even on the preference shares. The balance-sheet is not strong.

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The four ordinary general meeting of the shareholders of John Allen & Sons, Ltd., Ivybridge Paper Mill, was held the other day in London and the directors reported: "After providing for the debenture interest, trustees fees, the interim dividend paid in December last on the preference shares and managing directors' commission, there remains a balance of £2,398 7s 1d. Out of this sum the directors recommend a further dividend of 3¾ per cent on the preference shares, making 7½ per cent for the year, a dividend of 6s 7d be placed to reserve against stock, carrying forward the balance of £300 6s 7d." Walter H. J. Smeed, presided at the meeting, and amongst the shareholders was F. E. R. Becker of Becker and Co., Ltd., pulp importers. Mr. Smeed, in moving the adoption of the report presented by the directors, said he had much pleasure in stating that even with the depression in the paper trade during the year, the sales of their company showed an increase of about £6,000 more than the previous year and that year was the best the company had experienced. That showed their papers were regarded favorably, as they had had no lack of orders and had secured besides some very good contracts. But whilst they had been fortunate in this respect, the trading account in common with all other paper mills had been seriously affected by advances in prices of nearly everything the company used, and although they had succeeded in obtaining in some cases increased prices for their paper, they had not been recouped for the extra cost of production. Mr. Smeed went on to speak of the great economy the directors were exercising in the mill, and he also dealt with the installation of new machinery and engines to decrease the cost of production. Speaking of the recent fire at the mill, he said that the directors after settling things with the insurance company were able to show in the balance sheet the very substantial sum of £22,000, as a reserve against the plant, machinery and property. The report was considered satisfactory and the shareholders voted the two directors of the company the sum of £200 10s for their services.

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Most of the paper mills in England and Scotland are at present giving all the mill hands a day's excursion at the seaside, or some favorite resort not far distant from the mill. As an instance of what these excursions are

like, Edward Lloyd, Ltd., took 2,000 workers and their friends to Margate from the Sittingbourne mill in a specially chartered train. The party spent the day at the sea-side and all the arrangements were left in the hands of a committee selected from the workers. Similar excursions are taken by other mills and the treats naturally help to cement a better feeling between the mill owners and their workers.

The steamer "Norway," which trades between Christiania and England was stranded the other morning on a sunken reef off the Haddingtonshire Coast. She had a cargo of pulp and paper, in addition to a few passengers, and the crew.

The chief inspector of mills and factories in England and Wales has issued his annual report, and he draws attention to the violent explosion that paper dust causes when allowed to assemble in a closed chamber, and ignited by a naked light. He says that paper dust is very inflammable to a high degree—a degree of inflammability which is practically the same as that of very finely powdered Lievin coal containing 30 per cent of volatile matter. The inspector adds that in consequence of a serious paper dust explosion in a mill in France, he has issued instructions in England to have all faulty conditions remedied, where dust is allowed to accumulate. He has also a word to say on floors in paper mills. The proper laying and draining of floors, he says, does not receive the attention of architects and builders of mills that it should. A good concrete floor, properly laid, with sufficient fall to suitable channels, will stand for years where no acid is used; but one frequently finds a floor consisting of a few inches of concrete overlaid with a thin coating of cement and with no fall or channelling leading to the drain. In a short time such floors become pitted and hollow, and the water is retained. The quality of the flooring must always have an important bearing on this question in all mills. It can only be false economy to provide a floor in a mill which after a short period wears into holes and depressions. These wet floors are conducive to bad health amongst the workers, as well as being dangerous in the progress of mill work.

There is a strike at the Gray Valley Paper Mill in Kent and the terms demanded are a minimum of \$6 a week for the laborer and \$3.60 for the women workers. The owner of the mill says that the trade union that called the strike wants the mill turned into a "union mill" and while he is not prepared to do that, he is prepared to raise wages, if necessary. Men belonging to the Amalgamated Society of Paper Mill Workers have not struck work, but only those who belong to the National Union of Paper Mill Workers. The strike has held up a government contract for the India Office and now a "battle royal" is raging between the organizers of the National Union of Paper Mill Workers and the secretary of the other union, because the former gentlemen said that the Amalgamated Society of Paper Makers "kept their men in the mill to help the employer to keep the workers down." The unfortunate point about the whole dispute is that the mill owner has men belonging to two trade unions employed, in addition to men who belong to no trade union. He says if he makes the mill a trade union concern he must throw out the non-unionists, or compel them to join the unions against their wishes.

At the time I write, July 31, the British papermakers are feeling uneasy over the European crisis. If a Eu-

ropean war comes, the pulp supply in England and Scotland will be affected very materially, and trade in the paper industry will be dislocated beyond comprehension. Germany and Austria are large suppliers of pulp to English mills.

FORESTRY IN THE BRITISH EMPIRE.

Sir Herbert Maxwell (chairman) and members of the Forestry Committee of the Anglo-American Exposition, held a conference on forestry at the White City, on July 16th. Papers were read by Sir Wilhelm Schlich (Oxford) on "The General View of the Condition of Forestry in the British Empire;" by Professor Henry (Dublin) on "North American Hardwoods in Great Britain"; by Mr. R. L. Robinson on "The Relation between the Board of Agriculture and Forestry in England"; and by Mr. A. C. Forbes on "Irish Forestry." Members of the conference inspected the forestry section of the exposition.

Sir Wilhelm Schlich said that until comparatively recent times the management of British woodlands was governed by such conditions as the production of timber for the British Navy, shooting, and the amenities of estates. But during the last generation a considerable change has been brought about, and the economic aspect of forestry, stimulated by the requirements of the Indian Empire, has come into the foreground. As early as 1869 it was proposed to introduce systematic management into the Forest of Dean, Crown woodlands, so that they might serve as training ground for foresters, but the proposal fell flat. Now, forty-five years later, the idea was being carried out; but what a difference it would have made if the original proposal by Sir Dietrich Brandis had taken effect. The successful development of the forest administration started in India in 1864, has resulted in similar measures being taken in nearly all British Colonies. India had also had a decided effect upon the modern development of forestry in the United Kingdom. The net revenue of the Indian forests amounted in 1864 to one million rupees, and it had now risen to fourteen million rupees. It might safely be said that the development of systematic economic forest management in British India was something to be proud of. Next to India South Africa had grappled most successfully with the forest question.

Referring to Canada and the enormous loss owing to forest fires and to excessive and wasteful cutting, he said he personally had urged the introduction of regularised systematic treatment of the forests, because they were one of the main sources of supply to the United Kingdom. Fortunately a movement in favor of protecting and husbanding the forests had now received a new impetus. It should not be overlooked that, important as the forests were on account of the produce which they yield, they were even more important on account of the influence upon the preservation and regulation of the water supply of the country and as a barrier against northern air currents.

Concluding with a reference to Great Britain he said there were some fifteen million acres of mountain and heath land in these islands used for light grazing, and yielding on an average a shilling an acre each, if so much. Yet it had taken some thirty years of discussion before a step forward towards the planting of part of this had been taken. Of our timber imports, valued in 1912 at £32,000,000, some ninety per cent. were conifers, all of which could be grown in these islands, as well as all the timber used in the manufacture of paper pulp.

PULP AND PAPER NEWS

The Dunlop Pulp and Paper Mills, Limited, which were incorporated a few weeks ago with head offices at Selkirk, Man., have had plans drawn for a new pulp and paper mill which will cost about one hundred and fifty thousand dollars. Construction work may be started this fall. Among those interested in the new concern are F. A. Dunlop and T. McHattie, of Winnipeg. The capitalization is \$100,000.

An application has been made to the British Columbia Forest Branch by the B.C. Sulphite Fibre Co., of Howe Sound, to purchase two hundred million feet of hemlock and spruce. The company has an output of about fifty tons per day which is shipped to Japan and the United States.

W. H. Robertson, for many years proprietor and editor of the Morning Times, Peterborough, died on August 2, of paralysis.

A veteran figure in the stationery and paper line passed away in St. Catharines recently when death called B. C. Fairfield, who had been in business in that city for forty-six years. Mr. Fairfield was in his eighty-sixth year. One of his sons, George H. Fairfield, will carry on the business, being associated for a number of years with his father.

The Laberge Lumber Co. have been granted permission to increase their capital stock from one hundred thousand dollars to two hundred thousand dollars, by the creation of one thousand new shares of one hundred dollars each.

The tale industry is growing rapidly in Ontario. In 1899 there were only one hundred tons mined and the value was only \$500. Last year there were 8,238 tons mined of the value of \$74,500. During the last fourteen years there has been obtained, according to the report of Prof. Millar, 40,213 tons of the value of \$265,577. Almost all of this came from the Henderson tale mine at Madoc in Hastings County. The balance was obtained from deposits at Eldorado and Gananoque. It was not until the fall of 1908 that the material was ground in Ontario. In that year the tale mill began operations at Madoc under the management of George H. Gillespie, and there has been a rapid increase in the production ever since. Three years later a plant for grading tale was erected at Eldorado by the Canadian Tale and Silica Co., Limited. Large quantities of crude tale are now secured near that village.

J. R. McGregor, for many years sales manager for J. C. Wilson, Limited, Montreal, manufacturers of paper bags and wrapping papers, has resigned his position.

It is understood that the George Irish Paper Co., of Buffalo, N.Y., will, in the near future open a warehouse in Toronto which will be managed by E. A. Crippen, formerly Toronto representative of the Continental Bag and Paper Co. The company will do business in Canada under the name of the Crown Paper Co. It is said that they also intend to open branches in Winnipeg, Montreal and other cities.

G. A. Howell, of the Howell Trading Co., Toronto, and wife, are spending the month of August at Miner's

Bay in Northern Ontario. He will look into the matter of pulp wood supplies, etc., during his absence.

A. M. Huestis, who is the representative of several Old Country and American mills in Toronto, is spending several weeks at Little Metis, Quebec.

The Abitibi Power and Paper Co. of Iroquois Falls, Ont., have turned out their first production of ground wood pulp, and everything is now running smoothly. Daily shipments are being made, having started last week. The company report that a number of favorable contracts have been entered into and that the market prospects are good. Samples of the pulp received in Toronto and Montreal have been pronounced first-class and the plant is now running to eighty per cent capacity.

The Dominion Board of Railway Commissioners report that the railways are doing much better in the matter of fire protection this year than ever before, and are complying closer with the requirements of the board. The companies are co-operating heartily with the various agencies interested in the prevention of forest fires and working in harmony with the organizations of the federal and provincial governments. The situation has also been greatly improved by the increase in the number and strength of the lumbermen's and pulpwood owners' co-operative fire protection associations, of which there are now two in the province of Quebec, guarding a total of nearly fourteen million acres of limits.

Fine progress is being made on the various sections of the new fifty million dollars well and ship canal. The total length of this new waterway from Port Well-er on Lake Ontario to Port Colborne on Lake Erie will be twenty-five miles and it will have only seven locks. The locks will be eighty feet wide with a depth of thirty feet of water and capable of accommodating boats up to eight hundred feet in length. The mechanism operating the equipment will allow the locks to be filled in the short time of eight minutes. At Port Well-er the entrance piers are placed about a mile and a half from shore, where the total depth of the water is thirty feet.

Once more bush fires are raging over the country north of Cobalt, and several towns have had great difficulty in fighting off the flames, which have become threatening. Considerable standing timber and pulp wood have been destroyed, and settlers have lost their buildings and entire crops in many instances. Haileybury, New Liskeard, Englehart, Timmins and Porcupine and other places are in the path of the flames and the fire brigades have been busy fighting the element. The village of Buignes, which is located on the Quebec side of Lake Temiskaming across from Haileybury has been wiped out. A bad blaze is also reported from North Temiskaming where the Government is building a big dam. Unless rain comes soon in large quantities, there is every danger that the ravages of the flames will be extensive, and the situation become very serious.



The Markets

CANADIAN MARKETS.

The general paper and pulp conditions in Canada, owing to the European war, are in a state of uncertainty and what quotations may reach depends upon the nature of the struggle and whether Great Britain is able to keep her trade routes open. Conjectures of all kinds are heard and many opinions are offered. Prices in several branches of the trade are already stiffening, and quotations may go much higher. The circulation of some daily papers has increased fully a hundred per cent since the outbreak of hostilities and, should developments from the war zone come fast and thick, this state of affairs may keep up. Mills are receiving inquiries from almost every country asking for prices and deliveries on news print, but it is not likely that the export business will be increased very much, as all the plants have contracts covering the majority of their output for many months to come and will protect their regular customers first. Several exporting mills have withdrawn quotations on news print and will not undertake to supply any foreign demand except to the United States, owing to the disturbed aspect of affairs. It is reported that some of the wrapping paper mills will turn their machines over to news print and in a measure meet the augmented demand, as the market for Manillas, fibres and other lines has been dull for a long while.

Book and writing operators think that hostilities, if prolonged, will benefit them considerably, as several special lines, which some mills have been making to take the place of cheap book papers, will be discontinued and the book plants will have increased requisitions from numerous concerns. Jobbing houses handling special English papers such as grease-proof, parchments, esparto, ledger, sulphite and other products, believe that it may bother them considerably to secure fresh supplies, and stocks at present are low. A large quantity of mill board, straw board, chip board, etc., is also shipped to Great Britain, and the foreign demand is likely to fall off.

American mills, who buy ground wood, and chemical pulp from Canada, are making all sorts of inquiries regarding prices and deliveries and, in view of the anticipated shortage from European countries, hope, in a measure, to make up the deficiency from Canada. It is doubtful if they will find much relief from the Dominion, as if all the mills sold their surplus stocks and ran to their utmost capacity, they could ship more than ten to twenty per cent additional to what they are now doing. Some manufacturers of ground wood and sulphite have already put up the price from two to four dollars per ton delivered, and others have practically withdrawn quotations.

Packers of rag and paper stock anticipate that there will be great activity in their line, and dealers are scurrying the country for supplies. It is as yet too early in the struggle to prophesy what height prices may reach in any branch of pulp and paper, but the whole complexion of the trade is likely to undergo a radical change. In the meantime news print and chemical

pulp are in the greatest requisition, and if trade routes are maintained between Great Britain and Canada, conditions in all other lines may not be altered for some time.

As already pointed out, much depends on what foreign shipments of pulp and special kinds of paper can be imported, but one thing is certain and that is, no permanent good is likely to result to the trade generally from the war demand as, after the strife is over, there would be a demoralizing effect, and matters would be so upset as to work untold damage. The lull would more than offset any temporary advantages in price raising. The industry is such that its best and greatest good is served by steady expansion and solid foundation, rather than by abnormal demand and famine figures.

One leading manufacturer stated that all Canadian news and pulp mills would first of all safeguard the interests of those who have contracts and would in no way jeopardize their relations with such firms to secure higher figures elsewhere. Most of the publishers in New Zealand, Australia and South America had been getting their supplies from Norway, Sweden and Germany, and they would now seek to obtain them in the West, principally from British Columbia. One leading sulphite firm in Canada received an inquiry from the United States last week, asking that 1,000 tons be shipped in two weeks' time. Scores of other messages have been received, but as stocks are low and nearly all the output covered by contracts, peremptory orders have to be declined.

Quotations f.o.b. Toronto are—

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.00 to \$2.20 at mill in carload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.50 to \$3.00.
 Manila, No. 2, \$2.75 to \$3.25.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$4.00 to \$4.75.

Pulp.

Ground wood (at mill), \$16.
 Ground wood, \$22 to \$24, delivered.
 Sulphite (unbleached), \$43 to \$44, delivered in Canada.
 Sulphite (unbleached), \$44 to \$45, delivered in United States.
 Sulphite (bleached), \$56 to \$57.
 Sulphite (bleached), \$57 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 80c to 82½c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 35c.
 Over issues, 45c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinetts, 75c to 77½c.
 Flock, 85c to 87½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

UNITED STATES MARKETS.

(Special to Pulp and Paper Magazine)

New York, August 12.

The situation of chemical pulps at present is decidedly grave in this city. Hostilities abroad have caused a complete tie-up of business, and the outlook is that buying will be at a standstill for some time to come. Pulp consumers who have been holding off for some months past in the hopes of securing better prices, made frequent inquiries in the local market during the past week in the hopes of contracting for supplies to carry them over for the next year. Importers, however, could do nothing, and had to turn down order after order for certain grades of Scandinavian and German pulps. As a matter of fact the market is completely demoralized, and manufacturers of paper appear doubtful as to the future. The only hope now is that Canada can be in a position to furnish sufficient supplies for herself and this country as well. Several ships managed to reach this port, and also Boston, during the past week, with a fair quantity of unbleached sulphite, but in each case it was all contracted for. Were the importers able to divert the shipments, they would have been able to secure much higher prices. As far as quotations are concerned, everything is absolutely nominal on European brands; and Canadian brands are already beginning to benefit by the scarcity of arrivals. One large consumer came into the market last Tuesday seeking one thousand tons of No. 1 unbleached sulphite and offered a price that was greatly in advance of what he would have paid ten days before. He, however, had to withdraw his offer as he could find no one at the time to be in a position to fill it.

While ground wood pulp is not in such bad shape as chemical the situation here is also very grave. The greatly increased consumption of news print paper during the past two or three weeks has caused mills to run at the capacity, and in consequence use up much more ground wood pulp than they are generally accustomed to at this period of the year. As a matter of fact available supplies are not over plentiful, and it is the consensus of opinion that if the present situation keeps up there will be a very great scarcity of ground wood pulp before many more days. Prices are very firm indeed. Inquiries are numerous, and almost every consumer is anxious to lay in as much ground wood as he possibly can, believing that the coming months will witness such an advance in prices as to make profitable buying almost prohibitive. While the supply for this country comes chiefly from Canada (there being only a very small percentage imported from Europe) the increased demand for newsprint is reflecting an equally increased demand for this item. What the outcome will be only remains to be seen, but paper manufacturers in this city interviewed by your correspondent, are very dubious as to the future.

The situation of the paper stock market reflects pretty much the same condition as in pulp. Importers of rags and bagging have withdrawn their quotations, and are only filling orders at present from stocks in warehouses. Supplies, however, are limited as importations during the past few months have not been very heavy in volume. Large fine paper manufacturers who use only certain grades of foreign packed rags have been persistent of late in their inquiries, and have offered prices unheard of for many years for early deliveries, without success. Importers say that it is absolutely impossible to secure any sup-

plies, for, as one put it, should we be able to get a ship across the Atlantic, we ourselves would be unable to get sufficient quantities to fill it. Collections abroad are in a very bad shape, and there is very little to be had at any costs. The high insurance and the inability to secure credit, too, has its direct bearing upon the market and importers are now suffering intense quietness.

Pulp.

(Quotations on all European pulps have been withdrawn and available supplies are commanding very high levels. The following ranges are purely nominal and cannot be taken as a criterion of the market.)

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$17.50 to \$20, delivered.
Unbleached Sulphite, dom., 1.90c to 2.00c delivered.
Unbleached Sulphite, impt., 1.82½ to 1.95c., ex dock, New York.
Bleached Sulphite, domestic, 2.75c to 2.90c., delivered.
Bleached Sulphite, impt., 2.55c to 2.65c., ex dock, New York.
Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.
Unbleached sulphate, imptd., 1.75c to 1.85c ex. dock New York.
Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

The situation in the local paper market reflects a very active undertone. Buying is strong in all grades, and prices are not only being firmly maintained, but, in many cases are showing a decidedly upward tendency. Newsprint, in particular is moving in greater volume than has ever been reported in any mid-summer month. The supply on hand at the mills is comparatively light, and it is thought that if the large publishers continue with their many WAR EXTRAS the market will soon be practically exhausted. Mills in all sections are running at top speed, with orders coming in hourly. Present operations, however, cannot be maintained as the raw materials are rapidly being diminished. Two of the largest producers of newsprint in this city were personally called upon by your correspondent this week and they both were of the firm conviction that it would not be long before Canada would have to be drawn upon for about seventy-five per cent of the newsprint used in this country. One of the manufacturers produced his records, which showed that his sales August 1 were fifty-two and one-half per cent greater than in the two preceding weeks, which, as everyone knows, is considered to be the worst period in the year for newsprint buying. Water conditions are generally low during the last two weeks in July and the manufacturers take advantage of that period to give vacations and close down mills to make needed repairs. Such was not the case this year. Water conditions were fair and manufacturers have shoved operations forward as much as they could. However, the increased operations have not been sufficient to meet the demand and stocks are rapidly becoming lower and lower, and it is the consensus of opinion that this country will soon be in the same condition as is reported in France and England. But newsprint is not the only grade of paper that is meeting with increased demand. Book papers are moving almost as

well, and the supply here of this grade is gradually becoming depleted, with prices firming daily. All grades of wrapping papers, and krafts in particular, which, heretofore have been weak and uninteresting, are now picking up considerably, and reflecting a very strong feeling. Side run news is maintaining its own on a basis of a good movement. Tissues rule very firm, and passing business compares most favorably with any period so far this year. Screenings continue in good inquiry with prices being firmly adhered to. The local board market is reflecting signs of an early advance in prices, as manufacturers say that they have sufficient orders on hand at present to keep their machines running to capacity for the next two months. Anxiety on the part of the general public over friends and relatives in Europe has caused a heavy pressure of business at the local commercial cable and telegraph offices. In consequence the supply of paper consumed in telegraph blanks has been abnormal. One of the leading publishing houses which supply several of the large concerns with millions of blanks daily, has had to increase its force and double the output. This grade of paper is therefore in equally as good demand as newsprint, but the supply is plentiful at present, and no great scarcity is looked for.

While quotations have not changed during the interval, prices in all grades are decidedly strong, and it is the consensus of opinion of the local paper factors that present levels in almost every grade will be changed before the end of the month. However, for the time being current prices follow:—

Paper.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, side runs, 1.95c to 2.05c.
News, sheet, \$2.20 to \$2.30 f.o.b. New York.
Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 4¾c to 5c, delivered.
Manila, wood, \$2.40 to \$3.00, delivered.
Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
Kraft, No. 2, \$3.00 to \$3.35 f.o.b. New York.
Boxboards, news, \$28 to \$30 per ton, delivered.
Boxboards, straw, \$26 per ton, delivered.
Wood pulp board, \$40 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c f.o.b. New York.
Tissue, fourdrinier, 47½c to 50c f.o.b. New York.
Tissue, jute Manila, 40c to 41½c f.o.b. New York.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine).

London, August 2, 1914.

In the British paper industry business still remains dull. Many of the mills are short of orders, and stocks on hand are gradually getting larger. This time last year mill owners had orders to keep the machinery running for at least two or three months ahead, but that is not the case now, and the depression is not only confined to England and Scotland, but to Scandinavia and Germany. It is not surprising, therefore, that price-cutting has been resorted to in quotations for domestic supplies, not to speak of the export trade. The printing trade is also dull, which makes matters worse for the mills, but newsprint of a cheap and fair grade is finding a good outlet, thanks to the great demand for newspapers. Cheap white printing papers and super-calendered papers are down to rock-bottom prices, and all the wholesale paper men are advising their customers that now is the time to place orders with the mills, as they will receive better attention, owing to the slackness and can be executed on a cheaper basis than would be the case when the winter's trade brightens up the printing industry. Naturally, just now competition is very keen for any new business that is going, and mill owners are crying out against the prices being so low for the finished product, whilst the cost of production is on a higher basis. Wrapping and packing papers are changing hands freely, while good writing paper is in demand on export account. Esparto papers keep dull and of course high in prices.

Ground Pulp.

A few contracts for 1915 and 1916 have been settled, but new business for prompt delivery is scarce. From Scandinavia comes the news that water conditions are unfavorable and many of the mills have stopped producing pulp. Stocks at mills are also reported not be very large. In England stocks are fully replenished by the arrival of shipments against current contracts, so that buyers are taking things easy in view of the dullness that prevails in the paper industry. The European crisis is also causing some uneasiness, and Canadians would be well advised, should war break out, to keep a keen interest in the British market. Prices are now about as follows, c.i.f. British ports:—

Pine, 50 per cent moist (prompt) \$9.58 to \$9.60.

Pine, dry (prompt) \$19.20 to \$20.40.

For forward delivery about half a dollar extra is charged.

Sulphite and Sulphate.

The sulphate market is dull and lifeless. Sulphite is finding a good outlet and prices show no change—in fact contracts on a small scale are fixed up on an easier basis. Prompt business is scarce and large shipments are arriving from Scandinavia and Germany, as well as Finland, against running contracts. Reports from Sweden and Norway say that the cellulose market is dull and Americans are testing the feelings of producers. Prices are about as follows, c.i.f. British ports:—

Bleached sulphite (No. 1) \$56.40 to \$58.80.

Sulphite Easy Bleaching (No. 1) \$30.20 to \$31.40.

Unbleached Soda (No. 1) \$36 to \$37.20.

Soda Kraft \$32.70 to \$33.60.

Chemicals.

Owing to depression in the paper industry and the textile industry, chemicals are not in great demand, and

only a small volume of business is passing. Caustic soda is quoted \$48 for 76 per cent and \$48.60 for 77 per cent. Soda crystals are \$12.20 per ton and Salt Cake \$10.20 per ton. Ammonia Alkali, 58 per cent is unchanged at \$19.20, according to package. Alum is \$24.80 per ton and sulphur \$26 per ton.

Esparto.

During the past few weeks the shipments of Esparto to England have been frequent, but the market is having many "ups" and "downs"—one week the news being favorable and another week depressing. Early shipments at present are dear and scarce, and the business for forward movements is unsatisfactory.

In the rag and waste paper markets business is nearly at a standstill, but prices are unchanged. In foreign centres the prices of rags are on an easier basis for most grades.

Rosin and Loadings.

The rosin market is quiet and featureless, prices being on a lower level for papermakers spot parcels. China clay is unchanged and 1915 contracts are still being closed at the same prices as those for 1914. Good business offered for 1915 is in some cases accepted on easier terms, which Canadians might make a note of. Mineral white and other fillings are moving slowly and without change in prices.

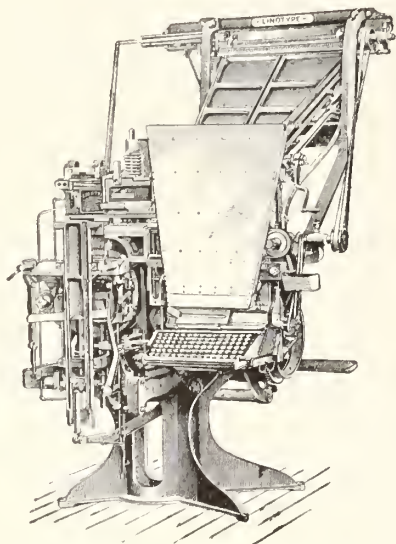
IN DANGER OF FIRE DESTRUCTION.

Northern Ontario has already lost much fine pulpwood this summer through forest fires, but it seems as if the danger of further destruction was imminent. A careful statement of the conditions on some of the limits and over large areas devoted to settlement contains the following: "Last year a serious fire destroyed considerable pulpwood along the high ridge that extends for twenty-five miles northwest from Charlton. Much valuable timber remains, but there is little or no settlement on the southwestern shore of the three lakes and when a fire occurs there are no settlers to fight it. Now that poplar is being cut for pulp there are hundreds of acres along the shores worth tens of thousands. There are already thousands of cords of this wood peeled and piled. Three dollars per cord is the price paid for poplar at the shore, and from four to four and a half when placed in the cars at Charlton. There is no doubt that nine-tenths of the forest fires in New Ontario have originated in localities where lumbering has been carried on, as the branches and tree tops are left just where they were lopped off.

ORGANIZATION OF FOREST PROTECTIVE ASSOCIATION.

The staff of the recently organized Lower Ottawa Forest Protective Association, to which all the lumbermen and paper manufacturers in the Ottawa and Gatineau districts now belong, will comprise a manager, three inspectors, and 50 rangers. In order to co-ordinate the efforts of all the agencies interested in protecting the region from fire, the manager of the association has been appointed an officer of the Forest Protection Association branch of Quebec, as well as of the fire inspection department of the Dominion Railway Commission. To reduce the fire hazard as much as possible, close co-operation with the settlers and with the railways operating in the territory will also be sought. The territory to be covered by the fire rangers will be over 10,000 square miles of timber lands in the watersheds of the Gatineau, Lievre, Coulange and Nation Rivers.

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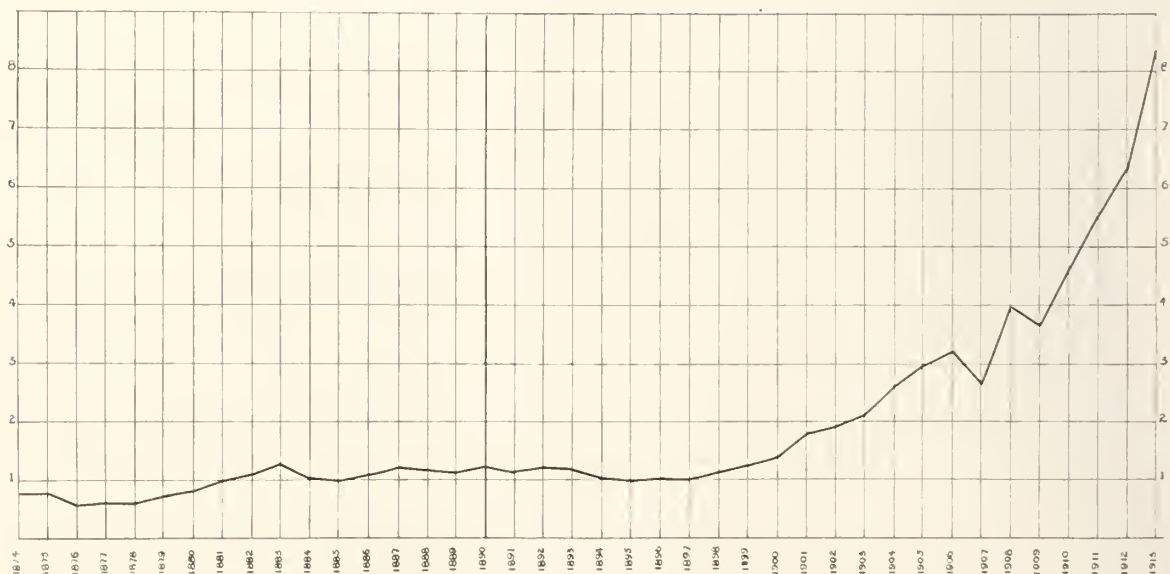
EXTENSIVE PULPWOOD OPERATIONS LIKELY.

Chairman J. L. Englehardt, of the Temiskaming and Northern Ontario Railway, returned from a visit to the northland last week and reported that extensive pulpwood and logging operations would be largely in evidence next season and that a good market and good prices would prevail. A good many settlers, he said, were taking the short-cut to clearing their lands by burning them over instead of cutting down the trees in the regular way.

PRICE ENTERTAINED THE DUKE OF CONNAUGHT.

William Price, of Quebec, the well-known pulp and paper man, had as his guest H. R. H. the Duke of Connaught, on the latter's return from his trip to Newfoundland. Mr. Price took His Royal Highness up the Saguenay to L'Anse St. Jean, which little village was gayly decorated for the occasion, and went out salmon fishing. Two large salmon were killed by the Governor-General.

CANADA'S PULP AND PAPER TRADE.



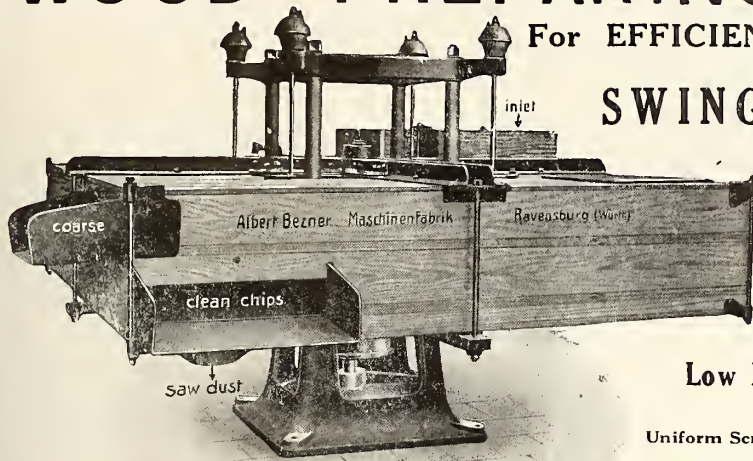
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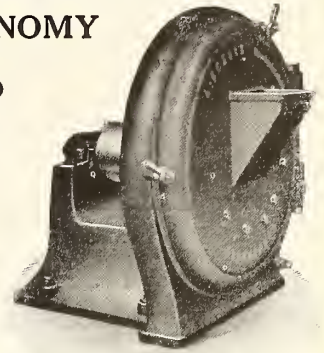
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A despatch to the Toronto Star, dated St. John's, Newfoundland, July 18, says:—"The investment of millions of dollars is being planned by a group of Canadian capitalists for the establishment of large paper pulp and allied enterprises on the west coast of Newfoundland, if the Government will grant the necessary concessions."

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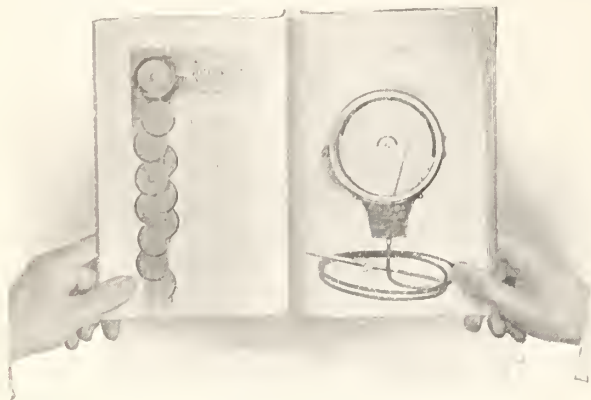
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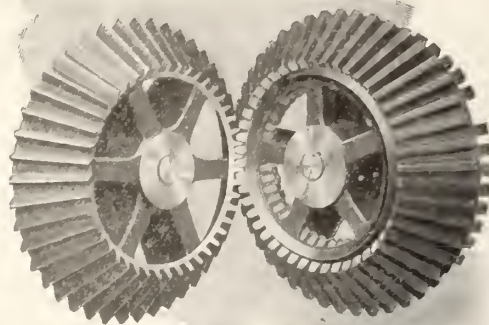
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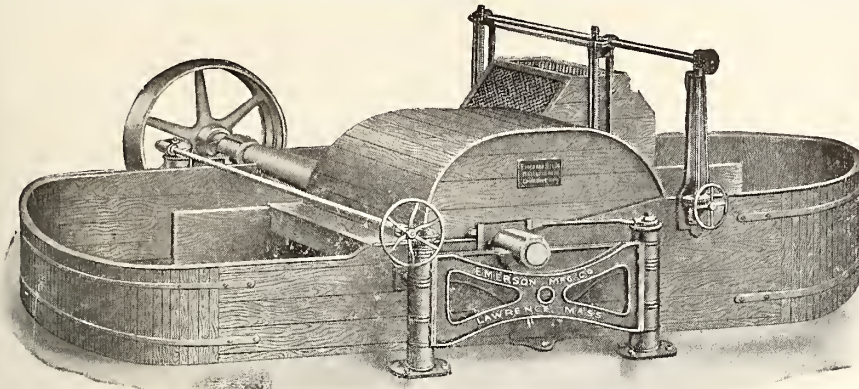
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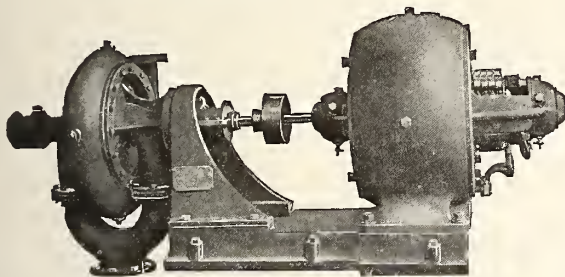
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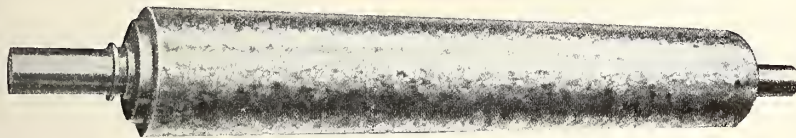
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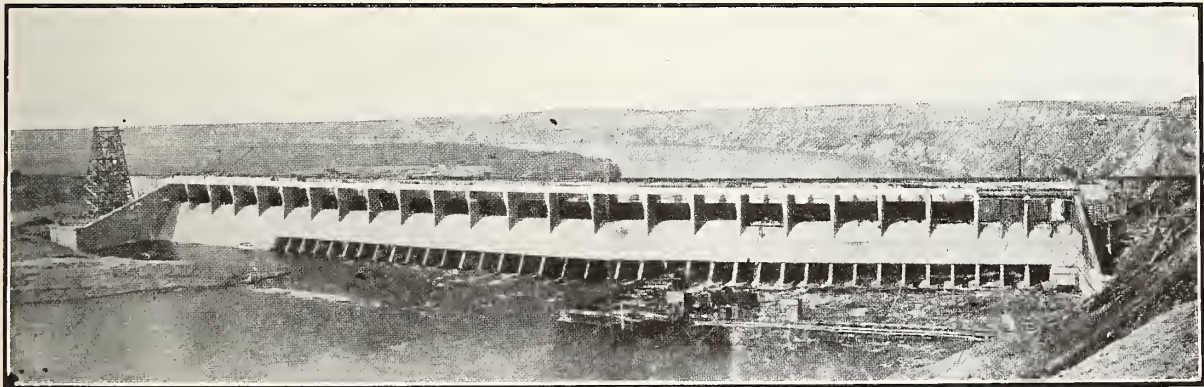
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Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Reddaway, F. & Co., Montreal, Can.
- Belting "Camel Hair"**
Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Blowers**
Sherbrooke Mach. Co., Sherbrooke, Que.
- Boilers**
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Fourdrinier Wires**
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calender Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Caulsticing Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chlp Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mig Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach Co Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152, Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
- Digester Lining**
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Felts**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can
Penmans, Ltd., St. Hyacinthe, Can.
Porrirt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.,
Tippett Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

- Heating**
Sheldons, Ltd., Galt, Ont.
- Hoists.**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.
- Knives**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.
- Kollergangs**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Laying Machines**
Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.
- Motor**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.
- Presses**
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.
- Paper and Pulp Machinery**
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales, Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appteton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurttemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England
- Pneumatic Thickeners**
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England.
- Pumps**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.
- Rags**
Walker, J. R. & Co., Montreal, Can.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
- Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alls**
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Tanks**
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
- Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Transmission Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
- Traveling Cranes**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Trolleys**
Blethen, Hugh R., New York, N.Y.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M. Co., Inc. New York, N.Y.
 Voith, J. M., Wurtemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Hamilton, Wm. Co., Ltd., Peterboro, Can.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
 Christie, Geo., Ltd., Glasgow, Scotland.
 Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
 Tippet, Arthur P. & Co., Montreal, Can.

Taylor, J. A., Montreal, Can.
 United Wire Works, Ltd., Edinburgh, Scotland.
 Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm. Co., Peterboro, Can.
 Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Machinery Co., Sherbrooke, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Basin Electric Light & Power Co., Ltd., Montmagny, Que.
 Beaver Co. Ltd., Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
 Booth, J. R. Ottawa, Ont.
 Bronson Co., Ltd., Ottawa, Ont.
 Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
 Colonial Wood Products Co., Ltd., Thorold, Ont.
 Campbell Lumber Co., Weymouth, N.S.
 Canada Paper Co., Ltd., Montreal, Que.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Compagnie de Pulpe de Dalmas, Dalmas, Que.
 Davy, James, Thorold, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
 Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
 Ford, J. & Co., Port Neuf, Que.
 Jacques-Cartier Pulp & Paper Co., Montreal.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 La Cie de Metabetchouan, St. Andre, Que.
 La Havre Pulp Co., Ltd., Bridgewater, N.S.
 Lake Megantic Pulp Co., Lake Megantic, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 MacLaren Co., Ltd., The James, Buckingham, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
 North Shore Power, Railway & Navigation Co., Clarke City.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
 Ontario Paper Company, Thorold, Ont.
 Ouatchouan Falls Paper Co., Ouatchouan Falls, Que.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Price-Porritt Pulp & Paper Co., Rimouski, Que.
 Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
 River-du-Loup Pulp Co., Ltd., Fraserville, Que.

Soucy, F. Florentine, Old Lake Road, Que.
 Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 St. George Pulp and Paper Co., St. George, N.B.
 Thorold Pulp Co., Ltd., Thorold, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Union Bag & Paper Co., Cape Madeleine, Que.
 Trent Valley Paper Mills, Glenmillier, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q.

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
 Dryden Timber and Power Co., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Quebec and St. Maurice Industrial Co., La Tuque, Que.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Booth, J. R., Ottawa, Ont.
 Dominion Pulp Co., Ltd., Chatham, N.B.
 Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordan Pulp & Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
 Lincoln Paper Mills Co., Ltd., Merriton, Ont.
 Ford, J. & Co., Port Neuf.
 Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
 Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
 Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
 Eddy Co., The E. B., Ltd., Hull, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Spe

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Montreal.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd, St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

ibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.]

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Miller Bros. Co., Ltd., Glenmillar, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmillar, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverville, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," Hercules Manilla, "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

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Minister of Lands, Forests and Mines

Toronto

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John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
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Vancouver, B.C.

Brake, Crendon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

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Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratliff Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 6½ King E.

Ottawa, Ont.

Barnard, W. R., 37½ Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratliff Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 12½ Richmond W.
Gage, W. J. Co., Ltd., 81 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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SUPERINTENDENT of experience wants position in mill making news, book, hanging, Manilla or specialties. Good on color and have good mechanical ability. References furnished.—S. W. K., Pulp and Paper Magazine, Montreal.

WANTED—Four first-class Wet Machine and Grinder Foremen for new 200-ton Mill; state fully ages and salary required. Apply Box No. 86, Pulp & Paper Magazine, Montreal.

CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

TECHNICALLY EDUCATED MAN, age 30; single; T.T.; holding highest diplomas given in England in papermaking; has taken advanced course in pulp and paper chemistry, six years' training under British expert in Kraft and pulp; experience in Britain, Norway and Finland; highest references; desires position as manager or assistant manager of Canadian mill, preferably after three months' time. Address "Canada," c/o Pulp and Paper Magazine.

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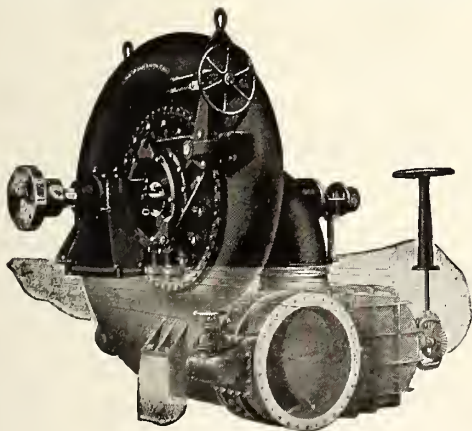
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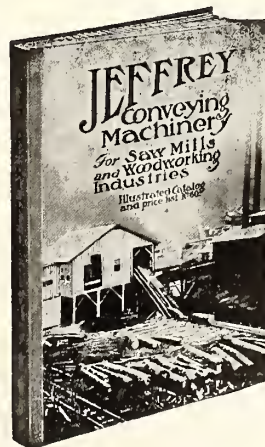
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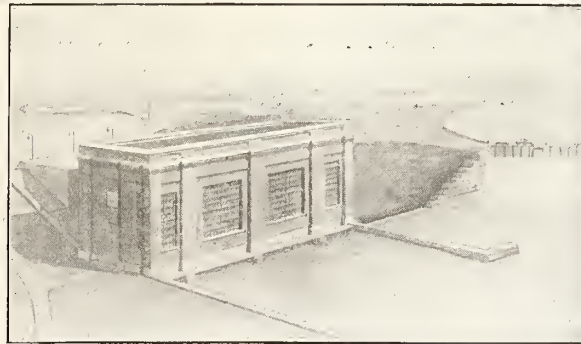
We are now carrying a complete stock of all regular sizes and weights at Montreal, Toronto, Valleyfield and Winnipeg, from which immediate shipments can always be made



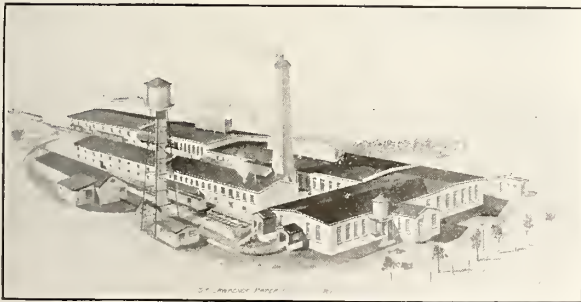
Barber Paper Mill, Georgetown, Ont.



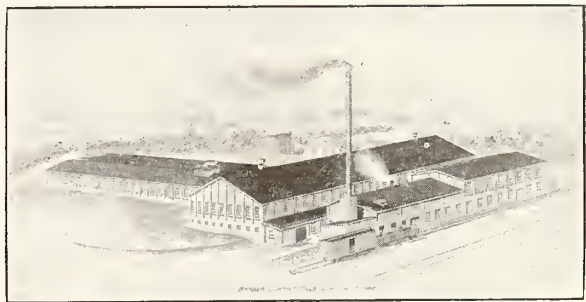
Montrose Paper Mill, Thorold, Ont.



Montrose Power Plant, Merriton, Ont.



St. Lawrence Paper Mill, Mille Roches, Ont.



Barber Coating Mill, Georgetown, Ont.

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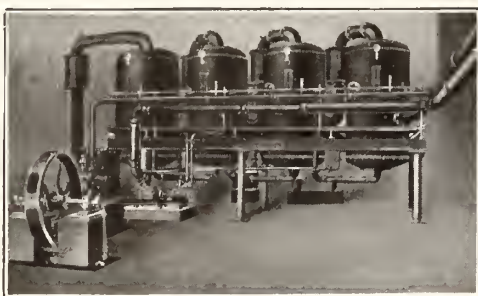
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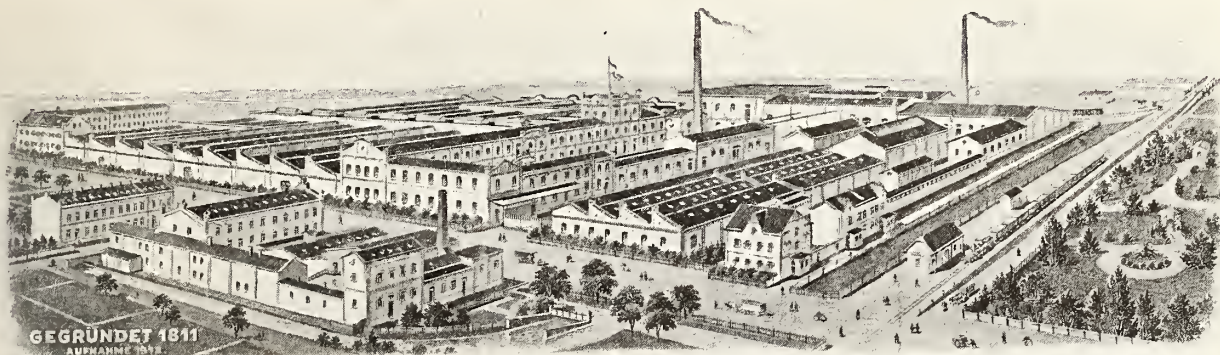
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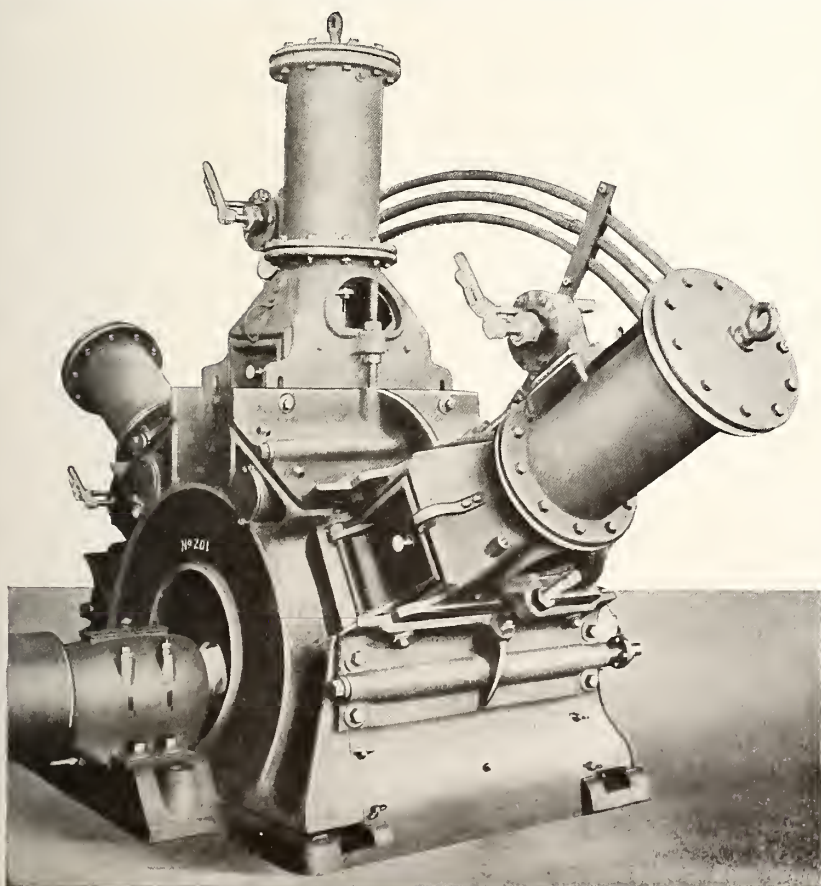
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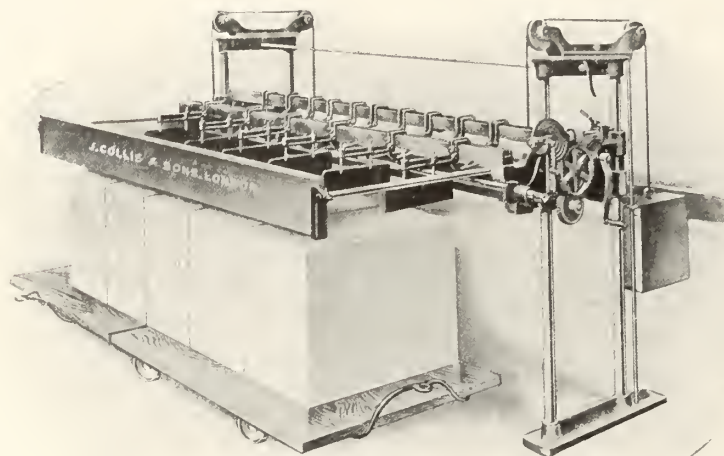
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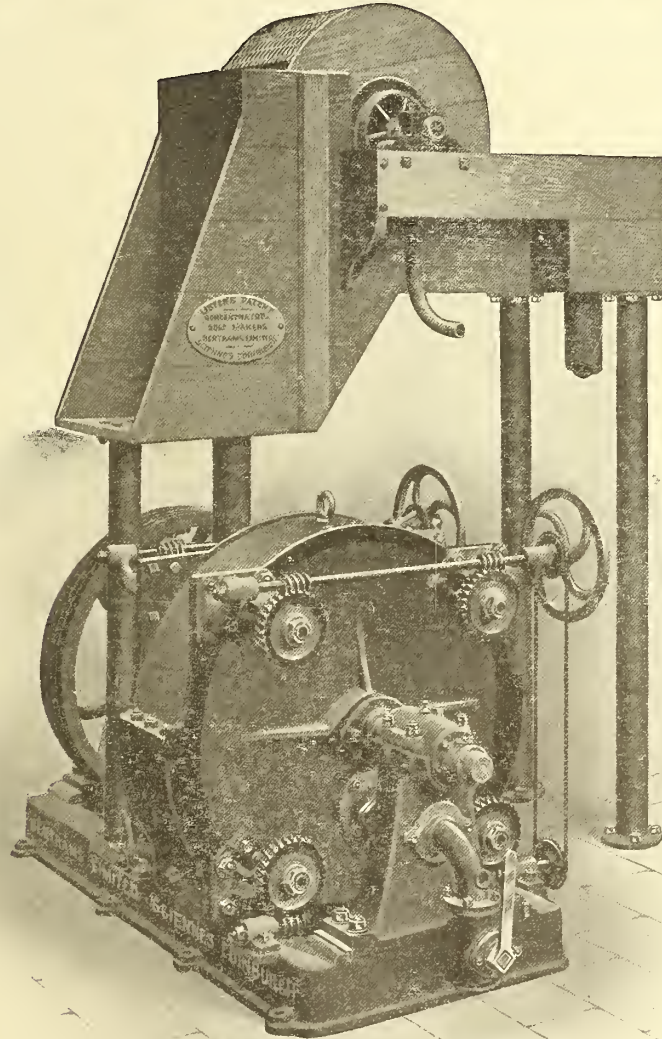
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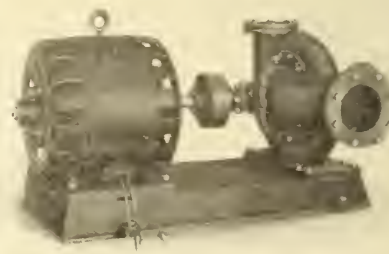
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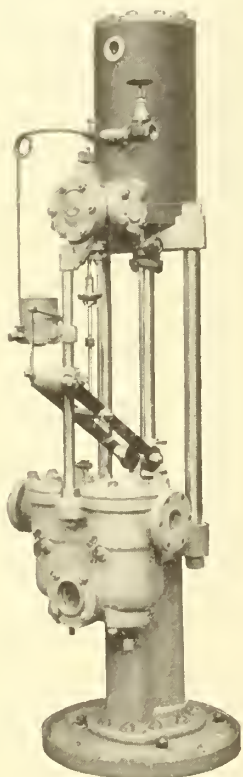
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PULP AND PAPER MAGAZINE OF CANADA

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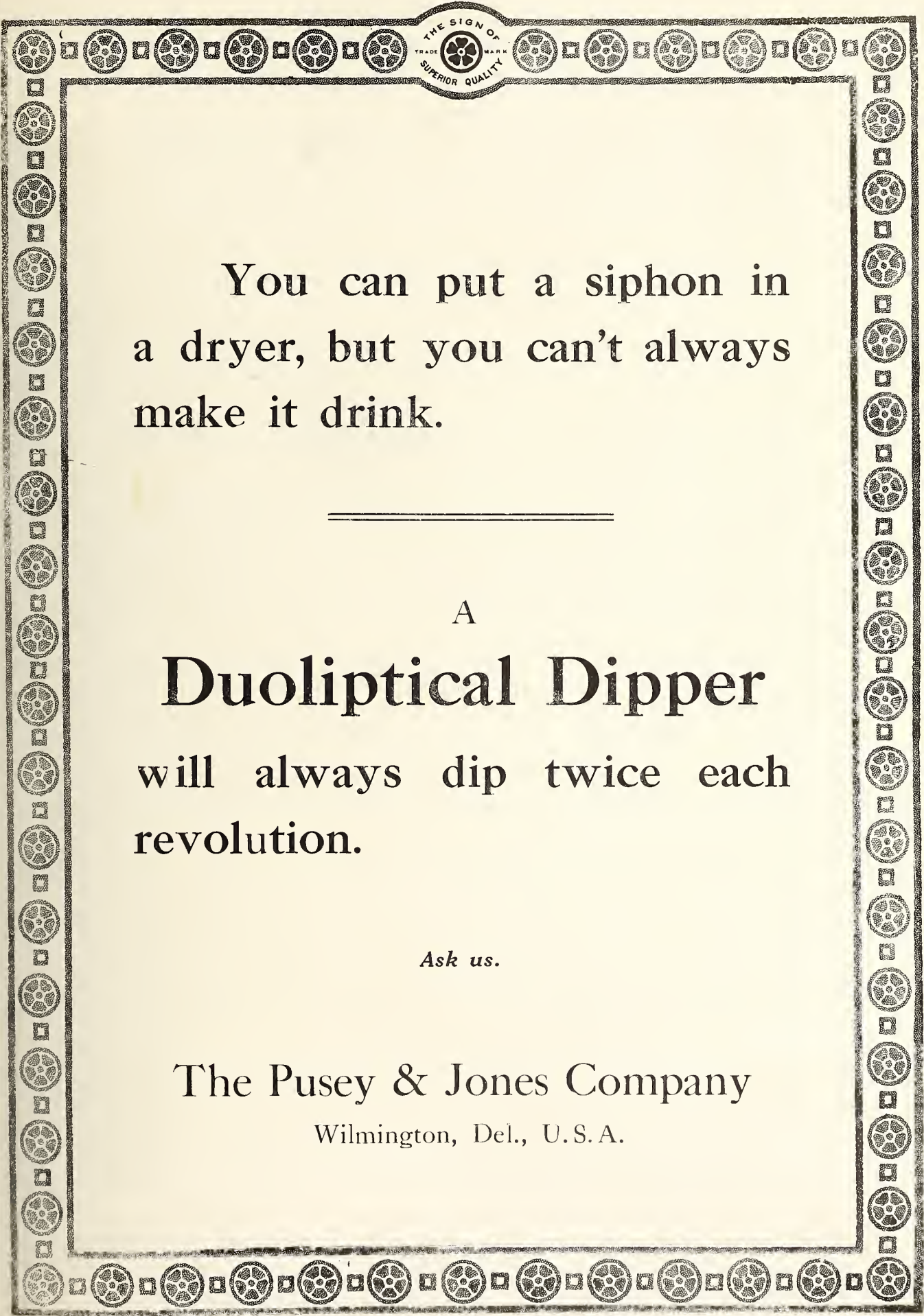
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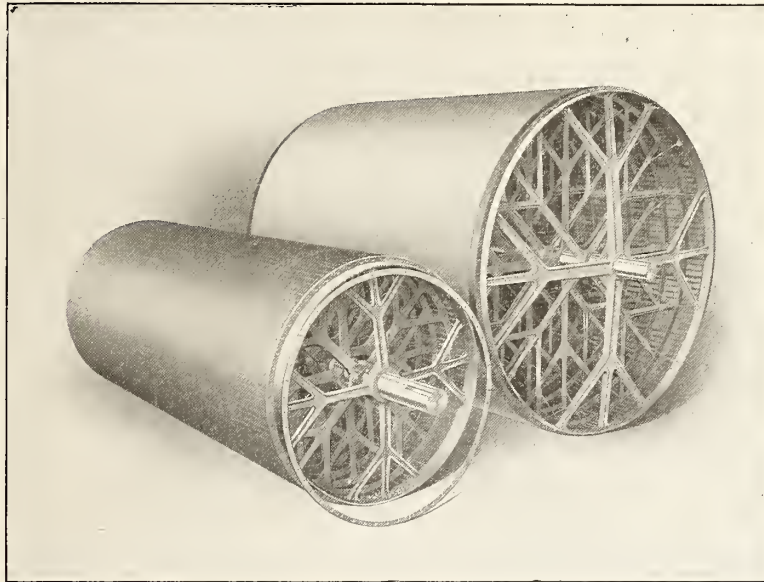
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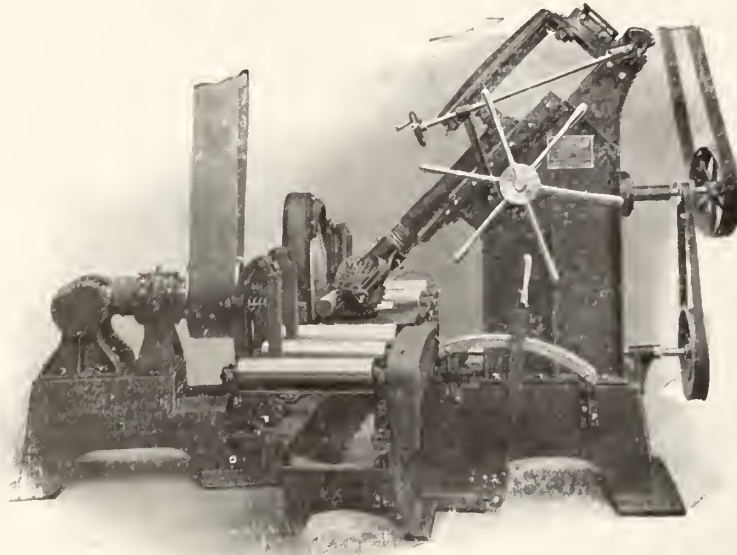
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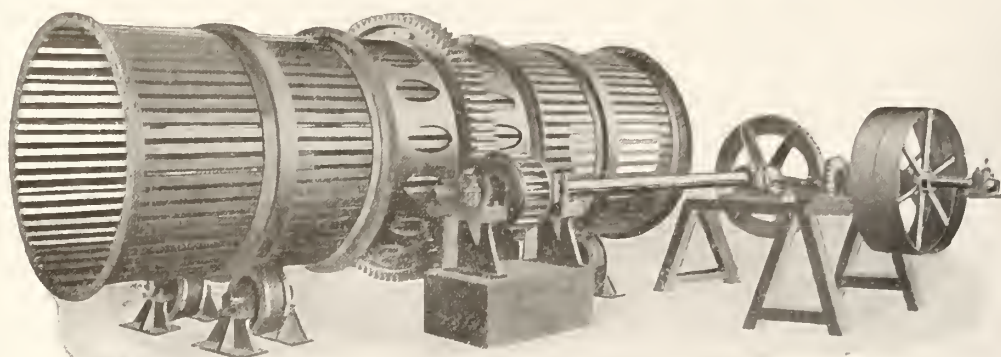
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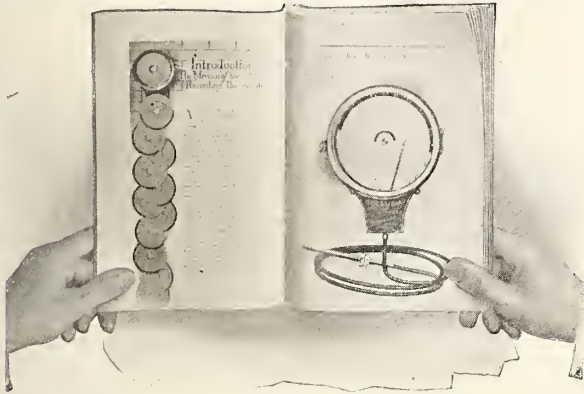
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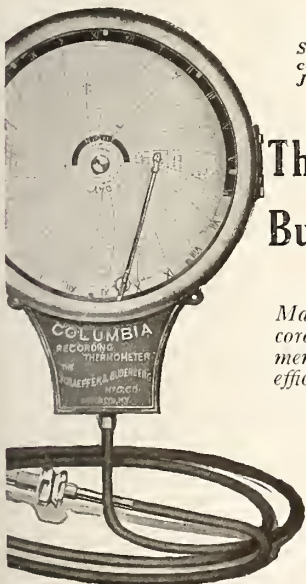
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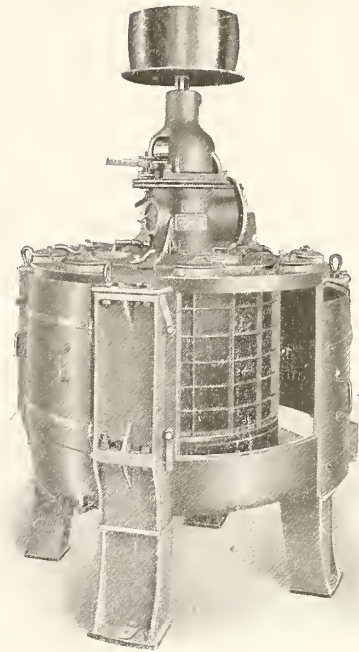
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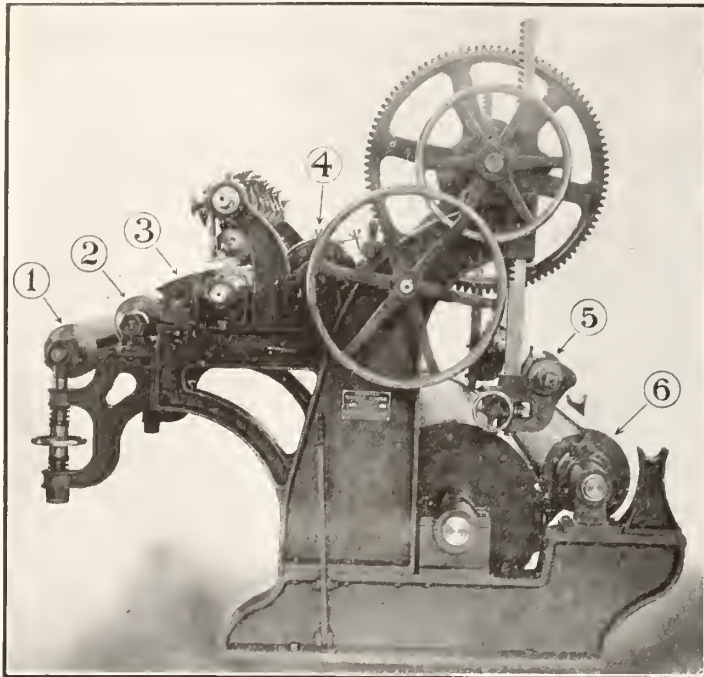
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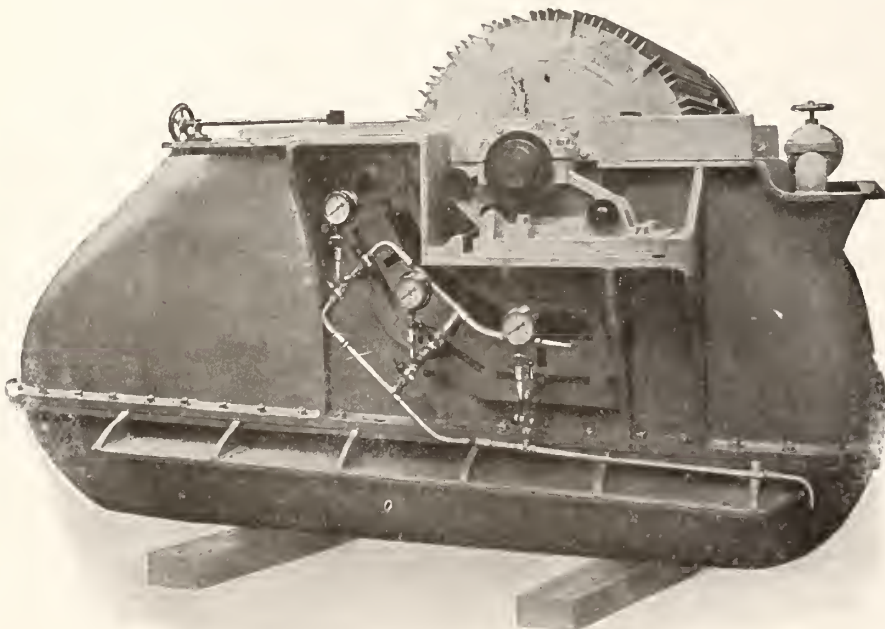
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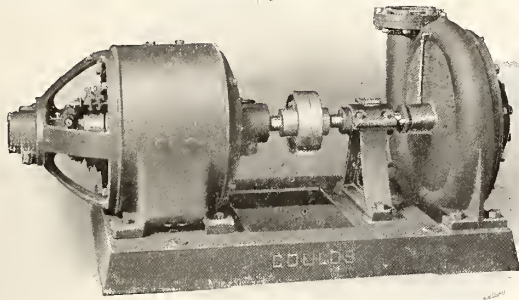


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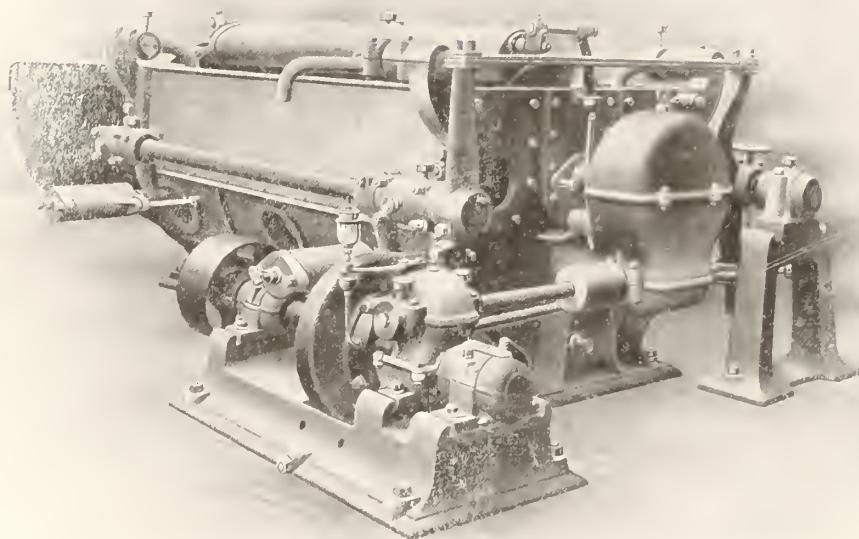
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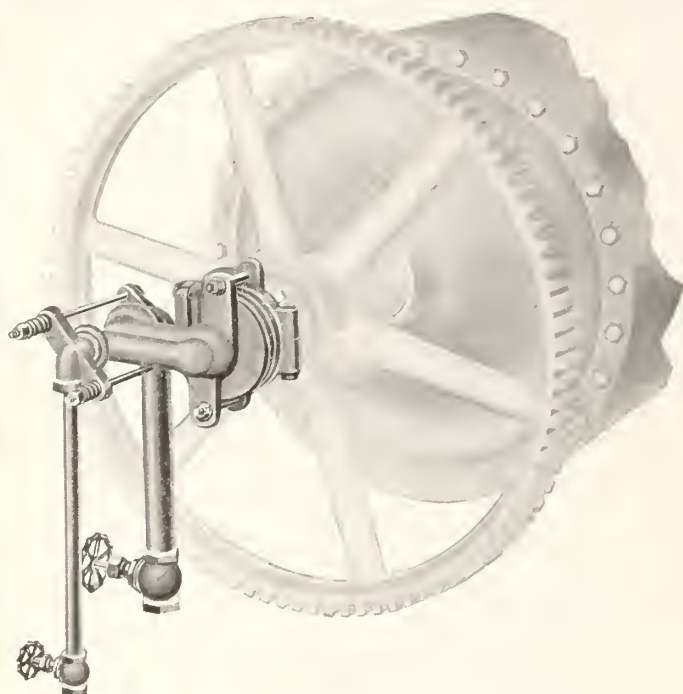
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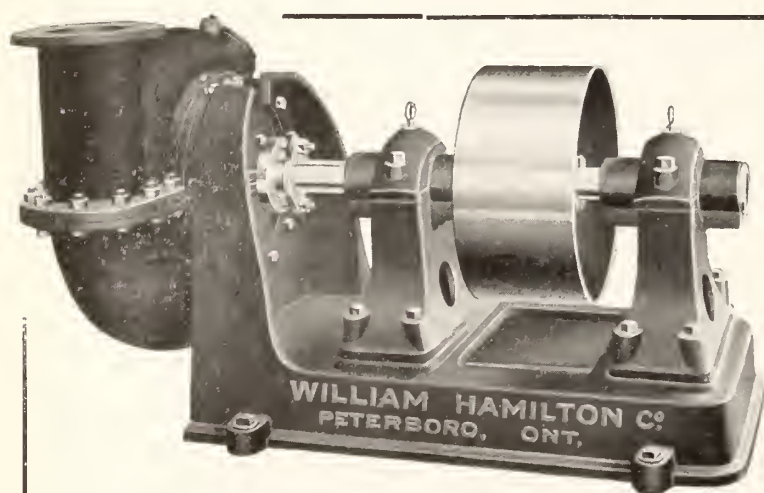
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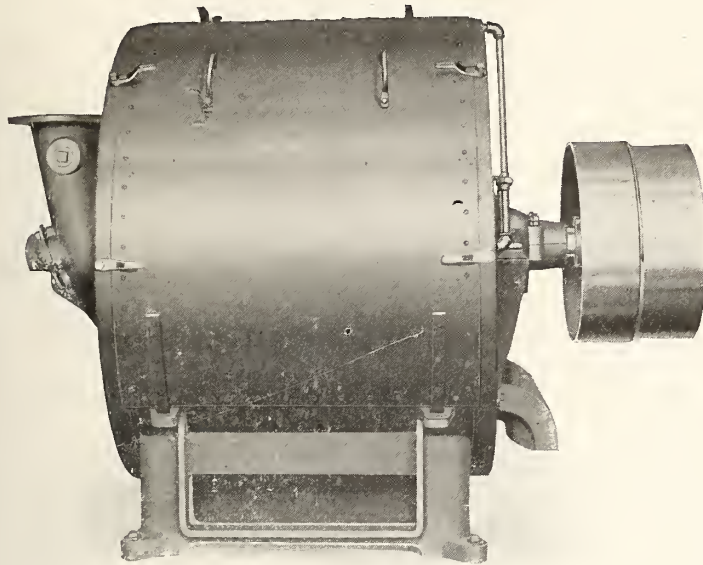
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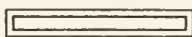
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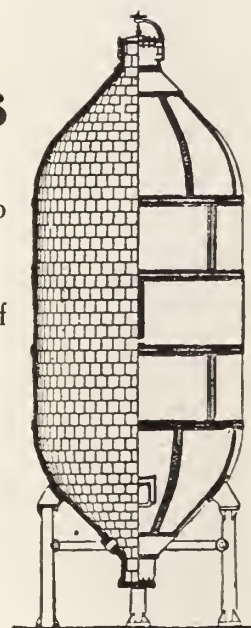
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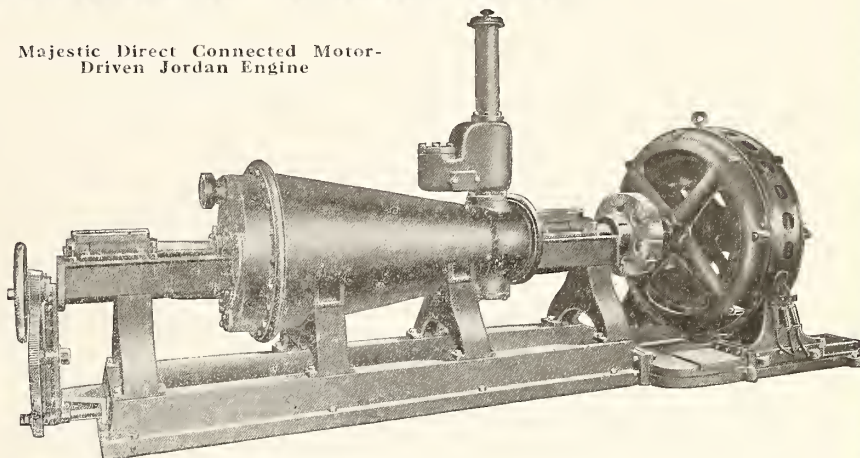


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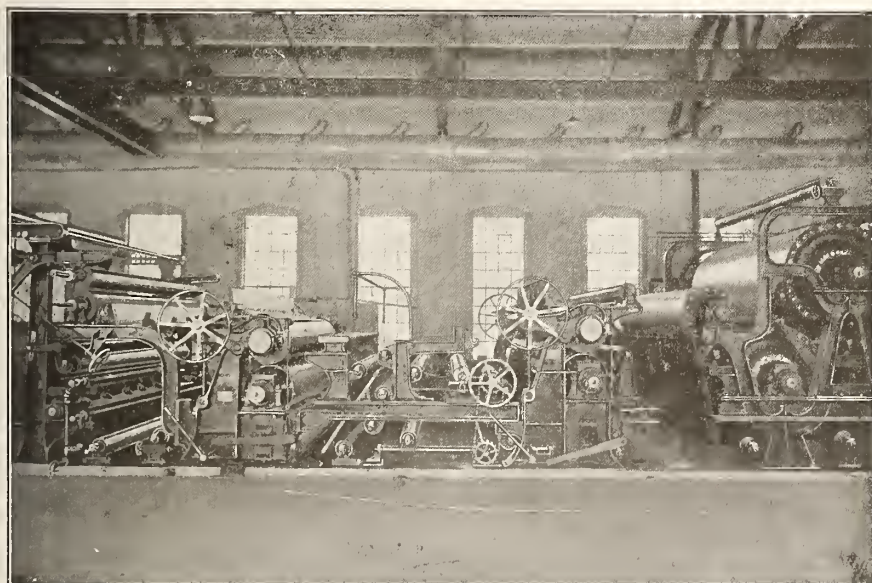
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A. G. McINTYRE, B.A., B.Sc., Contributing Editor.

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No. 17

How Long?

The one prayer in the heart of the world to-day is that the war may cease. This struggle is bitter, cruel, destructive and utterly at variance with all that men hold dear in sympathies and ideals. As Canadians, we have rushed to the help of the Allies in order to put down a man whom we would call a tyrant. Now, with devastation and waste of tens of millions of dollars, not to mention priceless lives, bearing upon us, we are bending every energy to the humbling of the Prussian war lord in as short a time as possible. The Anglo-Saxon world considers him a menace to peace and prosperity. Britain unsheathed the sword only to keep faith with the Belgian nation, which was being used as a stepping stone to the ascendancy of Germany.

It now looks as if peace might be reached by Christmas.

The Allies will fight inch by inch the German advance through France, and even should Paris fall, the Russian millions will have occupied Germany. "Hammer and anvil" the situation has been called, and Germany will probably be beaten flat between the two.

* * * *

Whatever the outcome, there will remain a tremendous work of reconstruction. If Germany is beaten her industries will be at a desperately low ebb. Skilled men will have been killed, her manufacturing plants, which are works of marvellous organization and efficiency, will be shattered, and the war indemnity which will be required, will keep the country poor for a generation. Further, for a time at least, the crime of breaking neutrality will not be forgiven by other nations and "Made-in-Germany" goods will have

difficulty in securing an outlet. Perhaps this may be a punishment well worth meting out. It will cost the other nations money, because Germany cannot buy unless she sells, and trade with her must be restricted, but if humbling Germany in the markets of the world will remove the haughty war spirit and tend to kill the operations of the infamous armour trust, Canadians will stand loyally by the policy.

* * * *

During the period of the war there exists, in fact, a wonderful opportunity. Not only in domestic markets, but in the British Colonies and in foreign countries, notably Argentine and Brazil, there are unprecedented demands for our paper products. Large manufacturers are having orders poured in upon them, many of them requesting that the paper be shipped regardless of price or risk. When such conditions as these exist the opportunity of Canadian papermakers is undoubtedly at hand.

* * * *

The first essential step is to get hearty co-operation among manufacturers. A most promising field for work is exhibited in the matter of South American trade. Canadian exporters can easily hold their own in the market, their product is of high quality, the demand large and the conditions of supply the very best. Our paper industry is in the infancy of its development. All that is required is the carrying vessels. A little over a year ago, certain firms making other than paper products made inquiry into the matter. Negotiations were carried on between them, the Manufacturers' Association, the Department of Trade and Commerce and the steamship lines involved. The progress of these negotiations is best indicated by

an excerpt from "Industrial Canada" of a few months ago:

"Canada should have adequate steamship connections with South America at the earliest possible moment. The recent tour of Mr. Poussette, Canadian Trade Commissioner, through the countries of South America, convinced him that many opportunities await energetic business men. But it will be no use to make goods for the South Americans unless we can get these goods carried to their ports.

When the Canadian Government entered into a contract with the Royal Mail Steam Packet Company (Pickford and Black, Canadian agents) last year, it was generally understood that a shipping service would be provided, not only to the West Indies, but also to the principal ports of South America. This impression was strengthened by the following clause of the contract between the Government and the company:

'The contractors shall issue through bills of lading from any Canadian point of shipment to any port in Central or South America, which are regular ports of call, for any of the steamships employed or controlled by the contractors on other services and which make regular connections with the service herein contracted for.'

So far as South America is concerned, the company have only quoted rates on traffic through to Venezuela, Columbia and Colon. In reply to enquiries they express doubt that rates can be given to Northern Brazil. Consequently practically all the great South American ports are not connected with Canada by our subsidized service, just at the time when the trade depression is forcing Canadian manufacturers to look abroad for markets."

The need for this steamship service is immensely greater now than heretofore. The market for paper is undoubtedly going to be tremendous, other commodities are seeking outlet, and prominent importers of hides in Montreal say that they would be delighted to see a line of boats running which would carry shipments to them. Hence, through co-operation and active advocacy of their needs it is quite probable that Canadian manufacturers could secure a new and most profitable market.

* * * *

But the extension of markets is not the only thing to be accomplished. Right within our own borders there are problems of an intensely important nature to be worked out. Economies can be effected, efficiency increased and a spirit of advancement maintained by the activities of the Canadian Pulp and Paper Association. There is urgent need of earnest, cheerful co-operation, mainly along lines of statistics and market reports.

The outlook for the future is the rosier in the history of the industry, but even this may be enhanced by wholehearted "boosting" by all concerned.

Industrial Hysteria

The Journal of Commerce, Montreal, recently published an editorial which has been reprinted in papers from coast to coast. Coming as it does from a financial paper of highest standing this forceful enunciation of principles which should stand foremost in the mind of every Canadian will perform a great service to the nation. Under the caption of "Industrial Hysteria" the Journal of Commerce says:

Canadians are showing symptoms of an acute attack of economic neurasthenia. No one can accuse us of being afraid to fight. Show us a German and we will tackle him, without hesitation. What we are afraid to do is to go on living. Instead of composedly and cheerfully taking up each day a task as the day appears, we are trembling in anticipation of unimaginable hard times and poverty. It is not hard times that we expect, we have them already: it is not simply hard times made harder by war. We could understand that and meet it. It is times so stark and inflexible that iron is in comparison as a sponge and the traditional poker pliant as a thread. More prosaically, it is something formless, vast and ghostly, the more dreadful because our reason gives it no shape. If we were all to be doomed to death by slow starvation we should scarcely be more frightened.

We must admit that the war will disturb trade, remove bread-winners from their homes, pile up private and public debts, and generally mitigate the prosperity of the recent past. It is well to be prudent, to eschew luxury, to avoid over-production, and to provide means for helping the specially unfortunate. Having said this we have said it all. The sun will shine, the harvests will ripen, all the staple commodities will have to be produced, and there will be just as much food and money in Canada next February as there was last February.

Fear is one of the greatest forces which operates in the human breast. In its two forms of worry and of terror it shapes much of the course of human conduct. Its chosen agent is the imagination. Its chief activity is crossing bridges before one comes to them.

If anything will precipitate financial disaster it is this mood of dread. President Wilson has vigorously pointed this truth out to our neighbors in the south. Our economic ills, like some of our physical ailments, are born and incubated in our thinking. When householders get panic-stricken and buy flour by the half dozen barrels instead of by the bag the price of flour must go up. The demand exceeds the supply and prices must rise. What seems to be a vindication of the forethought is only a consequence of the folly. When merchants, manufacturers, loan companies and banks run for shelter the flight transforms the wind into a whirlwind. When everyone predicts economic woe a false pre-

dence is developed which defeats itself. People seek to save money and get no money to save.

Moreover, the shyster patriot finds his excuse for grinding the faces of the poor. The coal merchant, with his bunkers filled at last year's buying price, hangs a flag out of his upstairs window and adds a dollar to the selling price of each ton. Bread meat, sugar, potatoes—the traffic in none of which has been affected—are racing up the scale. It is to defeat such scurrilous averies, itself terrified yet preying on the terrors of others, that the British Government has taken over the flour mills of Britain.

Let it be repeated that this is a time for economy. It is also a time for heroic effort to keep the business of this country going. It is the time to shorten sail, or run the screw at half speed. It is not a time to put on a life-preserver and take to the rafts. If the industry and commerce of Canada are paralysed this winter it will be because the people of Canada grew hysterical with fear of the unknown and unlikely.

Consider: the dearth is more likely to follow the war than to accompany it. And then it can be more advantageously met, when the stress and frenzy of the fighting is passed. War makes work in many ways. Enormous sums of money are distributed to the producers of many articles. Farmers, manufacturers of boots and clothing, coal miners, and all the middlemen who handle these things will be uncommonly busy. The taking of so many men out of their jobs opens doors to the unemployed. It is when the war is closed and the disbanded troops come home that the trouble is to be expected. The great panic of the Napoleonic period was in 1813, when his power had been broken by the disastrous campaign in Russia. Let us be cheerful yet awfully.

King David decreed that those who stayed by the staff should share in the spoil with those who went out to battle. He recognized that there was parity of merit, even though there was diversity. It is as hard to wait and endure as it is to fling one's self into the enemy's trench. We send our contingent across the sea with perfect confidence in its courage. Our brave boys will not disgrace the families they have left behind. They will find the courage they need.

Are we who remain behind finding the courage we need? Perhaps it is a little harder to find. We are not beckoned on by glory, nor keyed to exaltation. There is no pomp nor circumstance in the inglorious drudgery of keeping the national shop open. But that is the patriotic task of the stay-at-homes. Many a man would be ashamed if his son rifle in hand, failed to stand up against a charge of the foe, yet at the first indication of financial danger he himself deserts the employees who depend on him for work and wages, and runs to save his dollars. Strange that it is so easy to risk one's life so hard to risk one's money.

Let us call things by their true names. It is nothing

else than chicken-heartedness which ails many Canadians, more or less prominent in the world of business. They are cowards and they are in danger of bringing us all, themselves included, to needless penury and financial disaster. They are turning back in the day of battle.

Editorial Comment

There has been current in the United States newspapers a report to the effect that the St. Lawrence is being mined by the Canadian Government for the purpose of preventing attacks of German warships. Wherever this report found basis, it is only fair to give it the most emphatic denial. Marine officials in Montreal characterize the story as perfectly foolish, as the effect of such operations would be as bad as to have the river freeze up from the mouth to the great port of Montreal. Nowadays it is most important that the trade route should be kept clear in order that Great Britain may be in constant touch with her source of supplies and benefit by whatever commodities can be received. A Montreal official remarked that if it ever were necessary to mine the St. Lawrence, the work could be effected within half an hour. It is indeed unfortunate that these false stories should have gained ground, as they have doubtless given much anxiety to American importers of pulp wood.

* * * *

A development in the forestry branch of the British Columbia Forest Branch is the offer of timber on pulp lands amounting in all to over 200,000,000 feet. Since its initiation, the policy of the British Columbia Service has been to secure the best possible sales of timber consistent with a policy of conservation to ensure the maintenance of a timber supply for all times. This offer of nine timber licenses with privilege of thirty years for removal is a step in the right direction in the alienation of timber. It will be viewed with great interest by all pulp manufacturers and conservationists.

FOREST PRODUCTS LABORATORY MOVES.

J. S. Bates, Chief of the Forest Products Laboratory of the Dominion Government has returned from a trip to North Carolina where he was investigating the possibilities of the distillation of British Columbia yellow pine. The result of his investigation will be published in due course. Mr. Bates at the present time is supervising the work of removal of the laboratory from the old medical building of the University to the Molson property on University Street, where such equipment as is ready for installation will be put in. Mr. Bates will be unable to take the trip to Europe which he had proposed, but investigation will go rapidly ahead as far as the equipment will allow.

BLEACHING EFFICIENCY

CONSIDERATIONS IN CONNECTION WITH SUGGESTED STANDARDS FOR BLEACHING QUALITIES OF CHEMICAL WOOD PULP

(BY CLAYTON BEADLE AND HENRY P. STEVENS, M. A., Ph.D.)

Paper read before the London Section of the Society of Chemical Industry, June 8th, 1914.

We have had a good deal of experience in bleaching at different temperatures in paper mills, and one of us devised a circulating bleaching system for rags which was in use for many years, whereby the liquor in course of circulation was continuously drawn from the bottom and sprinkled upon the top of the material. The liquor was maintained at a constant temperature by means of live steam. By studying the temperature and observing the conditions of the bleached material, we came to the conclusion that the result was as good in point of strength of fibre, yield, etc., at 100 deg. F. as at any lower temperature, but that immediately we raised it to say 110 deg. F. or over, we noticed weakening and deterioration of the material, as well as increased consumption of chlorine. We therefore maintained the circulating liquor at 100 deg. F., and the bleaching was done in about one-eighth the time of that required at an ordinary atmospheric temperature. This seems to confirm Messrs. Baker and Jennison's statements for wood pulp.

Then, as regards the use of spent liquors, if liquor is drawn from a material which is in course of bleaching and periodically titrated for chlorine strength, it will be found that the chlorine strength diminishes after the liquor is out of contact with the material to be bleached, and diminishes fairly rapidly.

Another factor in bleaching is the question of agitation, which is a very important one. It is a common practice in some mills to add bleach during the process of beating, especially in rag mills. One of us has made determinations of the rate of exhaustion of bleach during the process of beating and compared the chlorine consumption with that of material bleached, say in the form of half stuff, but without undergoing the beating operation, and discovered that for the same amount of bleaching effect, the material which is undergoing beating consumes only about 40 per cent. of the amount of chlorine as compared with that in the form of half stuff which is not being circulated or beaten.* With electrolytic bleaching for linen half stuff a saving of 30 per cent. was effected, and for cotton half stuff, 47 per cent., by circulating in comparison with non-circulating of liquor. No doubt the circulation and the rapid agitation in contact with air, and possibly with the assistance of carbonic acid of the air, enormously accelerates the action, as well as making it more economical. Although concentration is a very important factor in the economy of bleaching, agitation is also important, particularly if the beating operation is proceeding at the same time. We have found that, when comparing bleaching efficiencies of different hypochlorites solutions such as by making a comparison between (a) bleaching powder solution in its normal condition, (b) the same on the addition of sufficient acid to combine with the base, (c) sodium hypochlorite, and (d) calcium hypochlorite reduced by bubbling chlorine into milk of lime, as well as (e) hypochlorites in the presence of salt, a certain rela-

tionship of efficiencies is obtained with any one particular material at a given concentration, temperature, etc., but if several materials are compared with one another, these various solutions behave relatively differently both in regard to efficiencies, i.e., chlorine consumption and rapidity of action, so that it cannot be said that one particular form of hypochlorite is more efficient than another except in relationship to one given material to be bleached, and under given conditions. For instance, we have compared chemical wood pulps with different forms of cotton half stuff and we have found these different hypochlorite solutions to behave relatively very differently.

Quite a number of papers have recently been published on the subject of relative bleaching efficiencies of the hypochlorites. The conclusions arrived at in most cases are in our opinion most erroneous. First of all there has only been one kind of raw material experimented upon, such as boiled linen, and another material might have led to quite a different order of so-called efficiencies. We have an instance in the above-cited comparison of cotton and linen half stuff and wood pulp compared with cotton half stuff. Secondly, the relative efficiencies have been expressed as chlorine consumption per unit weight of raw material on the assumption that the same bleaching effect is always accompanied by the same chlorine consumption the higher the figure in unit time, the greater the so-called efficiency. As a fact, the reverse is the case. The relative efficiencies of all hypochlorite solutions should be judged by the amount of chlorine consumed per unit of bleaching effect, and the smaller the chlorine consumption the greater the efficiency. Thus the Hermit solution was found to be much more effective than the ordinary bleaching powder solution because the chlorine consumption per unit of bleaching effect was so much less than with ordinary bleaching powder. This, from the fact that a large amount of unelectrolysed salt is present, may be accounted for by the influence of the undecomposed salt and not by any special qualities of the electrolysed hypochlorite, as it is now found that salt, when added in different quantities to solutions of hypochlorites, has a marked effect upon their efficiency.

In many cases, certainly, the addition of the spent liquor is a doubtful economy, as Messrs. Baker and Jennison clearly show in their paper, but we know cases in practice where the bleaching liquor which would otherwise have to go to waste is usefully expended by using it as a wash water in the breaker, the unbleached material in a very few moments completely exhausting the chlorine, after which, it is slightly further washed and then fresh bleach is added. In this manner the spent liquor is taken out of the sphere of action before the fresh liquor is added.

We have often found that bleaching is much more effective if followed by an acid treatment or by washing and then again bleach added. Many materials seem to come to a full stop unless the bleaching products are removed. Furthermore, the addition of acid

*Beadle, Chapters on Papermaking, Vol. 1 p. 57.

after the hypochlorite bleaching very materially improves the colour in many cases. The "more water more bleach" maxim is fully borne out in the results obtained by the Dobson process where the material is bleached with the maximum concentration, the amount of total liquor being only enough to make the material wet, and furthermore, in the old-fashioned method of tumbler bleaching, as was employed in the early days for rags. We have recently drawn attention to the fact that, with some lignified fibres, chlorination is produced in acid solution of hypochlorites (i.e., by hypochlorous acid) but in alkaline solution the ordinary bleaching effect is produced. Either one or the other effect is brought about according to whether the solution is rendered basic or acid, but the behaviour is largely controlled by the amount of boiling to which these lignified fibres have been previously subjected.

The use of carbon dioxide as an accelerator to bleaching powder was patented by Thompson in 1883, B.P. 959. One of us tested this process at the time that it was under investigation by Cross and Bevan, and subsequently suggested in a publication the use of carbonic acid gas by discharging same under the roll of a potcher or hollander in which the bleaching operation was going on. On visiting a German mill many years afterwards we saw this very operation. It is quite evident that a relatively small amount of carbon dioxide is sufficient to produce a marked acceleration which rather suggests that carbon dioxide acts catalytically. Very good commercial results are got, and it is well worth following up, but so far no relative figures are available for comparing the bleaching efficiency of such a solution with that of ordinary accelerator.

We have tested a process which involves the use of liquefied chlorine in steel cylinders. This has been in use for some years on the Continent. This bleaching process in some mills shows a considerable economy, in point of bleaching value and also in actual cost, over ordinary bleaching powder. For this purpose the chlorine is supplied in cylinders under a pressure of 5 atmospheres at 15 deg. C. The process is conducted in the following manner:—

The half stuff is run off on an ordinary wet end machine and delivered in rolls containing from 40—50 per cent. moisture. These rolls are packed through a manhole door into a large rectangular cement-lined chamber. The chamber is then hermetically sealed. The cylinder containing chlorine is placed on a weighing machine and connected up with the chamber, and chlorine gas passed in equal in weight to 2 per cent. of the dry weight of the material under treatment. At the beginning there is considerable pressure in the chamber. After a few hours the whole of the chlorine is absorbed, there being no trace of chlorine when the workman enters for the removal of the rolls. The rolls are penetrated to the interior and uniformly bleached. There are no lime salts, but of course a slight hydrochloric acidity, which is sufficient to dissolve any basic salts already present in the half stuff. The bleached stuff, which is now placed in the beater, generally receives a slight further treatment with bleaching powder solution. In a case of cotton rag half stuff, which under normal circumstances requires 12 per cent. of bleaching powder, the consumption by the above treatment was 2 per cent. of chlorine + 2 per cent. bleaching powder, and with a better color produced than can be obtained by bleaching powder alone. The point here is that, apart from a better

colour, 2 per cent. of chlorine as gas replaces 10 per cent. of bleaching powder, and therefore 2 per cent. of chlorine as gas is equal to 3.5 per cent. chlorine as bleaching powder; that is, the bleaching efficiency of chlorine as gas in this case is nearly double that of bleaching powder. In fact, for equal colours it is probably more than double, but in point of fact it shows quite as great an increase in bleaching efficiency as an electrolysed solution of magnesium chloride + sodium chloride does over that of ordinary bleaching powder. Besides seeing it operated as a regular process in Germany we have tried it in this country. The only difficulty here is the question of transport of the compressed chlorine in cylinders, which is not an easy matter to arrange with the railways.

With iron mordanted rags, bleaching powder sets the iron in a more insoluble condition. In such cases, when bleaching powder is used, it is preferable to acidify for the removal of the iron before adding the bleaching powder solution. Otherwise the iron salts frequently refuse to dissolve by subsequent acid treatment, but in the case of chlorine, the iron is chlorinated and consequently easily removed by subsequent washing. In Germany the Badische Co. are able to supply to some mills chlorine in this form at a rate that renders the process cheaper than using bleaching powder. They generally supply the gas in cylinders for use by bubbling into caustic soda, 12.87 kilos. of chlorine being required to transfer 100 kilos. of lye of 14.5 per cent. NaOH into bleaching liquid (sodium hypochlorite.)

Some years ago one of us made trials in a paper mill on a commercial scale with potassium permanganate in comparison with bleaching powder, and found that 1 lb. of bleaching oxygen as contained in permanganate did just as much bleaching as 5½ lbs. of bleaching powder oxygen when reckoned from the available chlorine equivalent of ordinary bleaching powder. The rapidity of attack in the case of permanganate is infinitely greater. Generally speaking, the rapidity of attack and bleaching efficiency seem to go together.

The foregoing examples, which might be multiplied, merely serve to show that there is a range of bleaching efficiency varying with the bleaching agents and the materials operated upon, as well as with the conditions employed.

In spite of all the work that has been done upon the subject, the economic problems involved in such operations offer one of the most promising fields for industrial research. To arrive at practical conclusions it is most important that the work should be done under mill conditions, or at least having due regard to mill conditions.

It is perfectly clear, therefore, that in the case of disputes as to the bleaching qualities of pulps, etc., a great difference of opinion might exist between the two parties, and it is a most desirable thing that a uniform and standard method should be agreed upon not only in case of dispute, but also on the question of making contracts. Messrs. Baker and Jennison have made out a very excellent case for their own standard which could easily be worked out in an ordinary laboratory, and the proposed to use standard colours in the form of porcelain is far more valuable than recording the colours by means of the Lovibond Tintometer and would appeal to the practical man. We would suggest, however, that instead of specifying that a pulp should exactly correspond with any particular one standard, it should be specified that it

should fall between two of the standard colours, on account of the fact that there might sometimes be a dispute as to which of the particular standards it most

closely corresponded with, but, if it falls between two, then there can be no question, and it gives a slight latitude to the manufacturer.

PAPER MILL VENTILATION AND HEATING

By ALEX. ANNANDALE

(Written Specially for Pulp and Paper Magazine)

These two points are very important in every paper mill, and as the one naturally associates with the other they may well be considered together.

To begin with there are two incontrovertable facts. First, hot air naturally ascends and second, cold air naturally descends. The questions we have to consider is how the questions of ventilation and heating affect the paper machine. Taking the question of condensation. This may be put into mill language very simply in the words "Drops from the roof." These drops are most troublesome in the machine house, because there they are always particularly prevalent over the wet end of the machine, and by falling on the wire they cause many breaks and much broke.

In other parts of the mill they are also very annoying, as many a man knows when he gets his shirt soaked through four after four, with these drops, which are always of large size, and most discomforting. Besides this personal view, one has to consider the injury to any roof which is always dripping with internal moisture.

Everybody knows that the colder the weather, the more trouble the drops will give. All machinememen know, that starting up on a cold Monday morning, is the time when the drops are at their very worst.

The dictionary says that "to condense" is to reduce into a denser form, as from gaseous into liquid. Well that is just what happens in a machine-house, where there is everything needful to produce condensation. A great deal of evaporation goes on, as all the moisture dried out of the paper has eventually to be absorbed, and carried away by the air.

Just as soon as a paper-machine starts up the evaporation commences, and presuming that the atmosphere in the house was absolutely dry to begin with, and that ventilation is faulty, in a short time it will be thoroughly saturated with water. You cannot see the water and often you cannot even see soft steam clouds, but the water is there nevertheless, and whenever that water saturated atmosphere comes in contact with a surface cooler than itself, the water promptly condenses and you have a copious supply of drops.

We do not think that any hard and fast line can be laid down for getting rid of this wet vapour, because most machine houses are differently constructed, therefore each case should be thought out on its own merits. The great thing to remember is—that the best and most economical way to set to work is to use experience and common-sense, to assist natural laws when necessary, and on no account try to fight against them. That, you may be certain, will never pay.

Putting the matter broadly, the ideal way of ventilating a machine house, is to have a sufficient supply of dry and moderately warm air entering at, or near floor level. This will naturally rise upwards, and as it rises it will absorb more heat and moisture. What happens next will largely depend on the style of

the machine-house roof. If it is a flat, or nearly flat roof this body of warm and wet air will spread all over and condense more or less all over, but decidedly most, above the wet end, because there you have no continuous source of heat like the dryers, and consequently the roof at that point is cooler.

You can check the condensation there considerably, by having a few lines of steam-heated radiating pipes near the roof, but these while a help are not by any means a complete cure, whether one has a flat or A shaped roof.

In Scotland and England, as a pretty general rule, each machine has an A shaped roof over it, which of course necessitates a valley gutter between each machine. These in the climate there, give no trouble, but in a country where there is a heavy snowfall they probably would be troublesome. However, for ventilating purposes the A roof is certainly good.

With properly constructed ventilation along the ridge, and a few lines of low pressure, steam radiating pipes, above machine and wire, they wash well, and with them, these most unsightly hoods over the dryers can be entirely avoided. Sometimes this class of roof and ventilator are helped by fans in drawing the saturated air out, but in the writers opinion it is better to blow in warm dry air at or about floor level. It will rise up carrying with it the saturated air and pushing it out of the ventilator in accordance with natural laws. So much for A shaped roofs.

As to flat roofs. If it can be arranged at all, top ventilators should be fixed above the machines. In a cold country means should be provided for regulating the amount of opening, because the colder the outside temperature the greater will be the desire of the warm air to rush out, but against that the colder the outside air the more it will want to get in, so in practice it will be found that the colder the weather, the more the top ventilators will have to be closed, and also the bottom inlets through which the fresh air is admitted.

With a flat roof, we do not think there is much prospect of getting efficient ventilation entirely with roof ventilators, so it is necessary to fall back on fans to some extent to complete the extraction of the saturated air. These fans must be judiciously placed so that they may do efficient work. It is also well to remember that a few good large fans will do better than a larger number of smaller ones. Better have too much ventilating power, than too little. In placing a fan always ask yourself, if you are going to place it where it cannot avoid doing the work it is put there to do. Do not put a good exhaust fan right opposite a constantly wide open door (such things have been done) and expect it to do its work. You may be sure that it will draw through the door, as that will be natural and more easy than shifting the saturated air you want it to remove. Fix your fans so that they cannot get any air other than that you want moved out.

So far we have been in the machine-house; but before saying anything about heating, we may say generally, that wherever you have a room with steam escaping into the air, there you will have roof condensation, unless your ventilation is right. Generally, the machine and grinder rooms are two worst places. When considering heating, it is well to remember that when you are planning the heating of any department you should arrange your heating appliances in such a way as to assist your ventilation.

The writer likes to see every department of a mill well ventilated, not cold and draughty, but with just a decent atmosphere in which men can do their work well and with comfort and not go off four used up, and limp, owing to the want of a reasonable amount of fresh breathable air.

Heating mills in this country is quite a serious proposition owing to the severe winters. It is quite a large and unavoidable expense.

So far as the writer's experience has yet gone, it can be done most economically by exhaust steam, if available) or if not, by steam reduced to not more than four or five pounds pressure.

It is a great mistake to use a lot of grids made from small malleable iron pipes. They do not last, have far too many joints and cost a great deal too much to keep up. It is far better to use Gilled Cast Iron Pipes, a far smaller number give the required result, as they throw out a wonderful lot of heat. They can be fixed at small cost, and unless deliberately smashed, will last at least a life-time.

In conclusion, we would say use common-sense when arranging your ventilation and heating. If you are in doubt as to the working of your ventilation, make some smoke at various points in the department under consideration, and watch how the smoke travels; that will give you a good notion of what is going on in the way of air currents.

Do not on any account fight against nature by trying to make hot air go down, or cold air go up, and do not expect ventilation and freedom from drops unless you let out your saturated air. It wants badly to get out and you also want to be rid of it, so why not give it vent by the easiest possible route, and let it go, by so doing you will save many a break on the machine, and all the numerous "cuss" words extracted from the machine staff by "drops from the roof."

THE TEUTONIC WAR LORD

SERIOUS POSITION OF PAPER AND PULP INDUSTRIES.

All British Eyes Turned to Canada for Succour.

(From Our London Representative.)

The German Emperor has driven his mailed fist through the peace of Europe and shivered it to atoms. The result is that the peace of more than half a century has been broken, and the British nation finds itself at war with a hitherto friendly people, to which are bound not only the ties of kinship, but also an immense volume of reciprocal trade, which now becomes shattered for probably another decade or two. Between the people of Great Britain and Germany—and when I refer to Germany I very naturally include the papermakers and the pulp producers, who have traded with us so long—there is not and there never has been any quarrel. Commercial interests, friendly rivalry in science and engineering, and scientific research, along with a mutual desire to forward projects for the good of mankind and industry, have helped to bring the Teutonic and the British people into close touch, and they have found much in each other to admire and adopt. Business relations were never on a better footing, as was proved by the visit some time ago to London of the highest officials in the German Press, and the reciprocal visit to the "Fatherland" by representative ships of the British Navy. But all these events have now become things of the past, and the Continent of Europe is shaking to its foundations with war, unprecedented in extent, and, I fear, in horror. In the midst of these unparalleled conditions all eyes in British territory were turned toward Canada for help and succour, and I am glad to say that the Dominion has nobly responded, so much so that when the news of that help and succour was lashed to the Antipodes the Premier of New Zealand vividly summed up the position in three words, when addressing the legislature, "Well done, Canada."

Before dealing with the condition of the pulp and paper markets, I think a little enlightenment on events prior to the European crisis would be found interesting. In London we have something like 40,000 German people, and a huge proportion is engaged in the paper industry in many ways. We have also Finnish people in our midst, and a few Austrians in the same industry. Naturally the business relations going on between London and the principal paper and pulp centres in Germany have been very great. Everything worked smoothly, and not a discordant note has been heard. The same applies to the Finnish paper and pulp men, as well as the Swedes and Norwegians. We all appeared to be one happy family, though the number of Frenchmen interested in our industries might be counted on the fingers of one hand. I have seen German naval men entertained here, including the Kaiser, and I know how they enjoyed themselves; I have stood in a dense crowd of Englishmen, who came straight from their desks in paperdom, to shout "Viva La France," as President Poincaré drove by in decorated streets on his way to Paris; I have seen the representatives of the Austrian Royal House cheered on leaving King George's palace; and I have dined with the German, French, Finnish, Austrian and British paper and pulp producers, who, as if one man, rose en masse to toast the health of the King of Great Britain, and sing the National Anthem. The other night, outside Buckingham Palace, I heard the British and French people sing "Britons never, never shall be slaves." I could not see any Germans in that dense crowd of Britons and Frenchmen, but curiously enough I espied a well-known Austrian paper and pulp agent. The German absence was attributable to the dreams

of world wide conquest which the Teutonic War Lord has been having recently. He has compelled paper agents and pulp agents to quit this country for the "Fatherland," and their offices are now desolate—probably the occupiers of these have found their resting place in Belgian territory, as I pen these words. At all events, Kaiser Wilhelm says:

In dimes of peace I work up vars,
Mein vas der helm und spear of Mars,
Vat cate I vor den douzand Czars,
Meinzeil—mid Gott?

That's the position in a nutshell, so to speak, and that is the position which left pulp and paper men situate in London and Manchester in such a predicament between the 4th and the 13th of August, that they were beginning to come to the conclusion that the British Isles had fallen into a state of seige. Prices of paper and pulp could not be obtained on any pretence from the continent. Wireless was even called on for assistance; but all in vain, and the pulp importers had to assume the role of the infant child and be spoon-fed with the few small parcels that trickled in from Norway and Sweden, through the courtesy of the British fleet.

The position then, was, that paper mills in England, Scotland and Ireland, were clearing out what stocks they had in hand, to meet current contracts, and prices for new business rose rapidly. Dealings in pulp in London and Manchester became less and less by degrees, and the few parcels placed on the market soared high in values, the owners of which demanded money down for all spot transactions. The feeling, I need hardly say, of the prospect of no pulp arriving from the continent caused a thrill to go through ones body, until the welcome news arrived that the British fleet had made the coast clear for shipping to and from Norway. Prior to the reception of the news, papermakers were beginning to look to Canada for the raw materials, and paper agents and merchants were wondering what the stocks of newsprint were like in all the producing places in the Dominion. The demand for newsprint, owing to the war news in newspapers, was—and is still—exceptionally great, and the prices increased from 3 cents to 4 cents per pound. In one case I know 4½ cents per lb. was paid, and if there is any spare newsprint in Canada the sooner it is delivered in England the better off will be the producers. Everything points to the States dealers and jobbers trying their hand as middle men in the handling of Canadian newsprint, because they know it is appreciated in English circles. Those who have direct dealings with Canada in pulp and paper on this side find themselves in a very happy position in the present crisis, but I would like to see the men of the Dominion taking a greater hold on the British pulp market and a greater interest in it than they have done so heretofore. Now is their time to tackle shipping rates and get the ground wood, and any sulphite or sulphate that is available, shipped here. As a rule—as a matter of fact it is British custom—war suspends all contracts; that is the position with Scandinavia to-day unless the British fleet will keep the waterway clear between the English coast and Christiania. Then, of course, German pulp or paper cannot enter any part of the British Isles until peace is declared, because the King's proclamation issued on the 5th of August, forbid any business dealings of any kind with the enemy's country. The German position should, therefore, be occupied in the British market by Canadians, and held for ever. It is only a matter of dealing with the situa-

tion—and it is a subject that the Pulp and Paper Association in the Dominion should tackle without the slightest delay. All the newspapers north, south, east and west of the British Isles are cut down to the smallest minimum. The London "Sunday People" says, in a notice to its readers:

"The importation of pulp from the Continent, from which printing paper is made, being rendered impossible just now owing to the war, it has been found necessary to lessen the size of newspapers, and thus avoid a paper famine. 'The People,' in common with other Sunday papers, is therefore reduced to-day to 12 pages." The "London Evening News" says: "An acute famine in paper has set in not only in England but also in France and Germany. Last night's London evening newspapers showed signs of the stress of the time. Thus the 'Evening Standard' has been reduced from twenty pages to twelve and the 'Pall Mall Gazette' from twelve pages to eight. It is understood that drastic changes in the size of newspapers will take place in the immediate future owing to the impossibility of obtaining raw material from Norway and Sweden." "The Times," "Morning Post," "Daily Telegraph" (the proprietors of the latter journal, like those of "The Times," have their own paper mills) are also reduced in size. The French papers are also feeling the scarcity of paper, as I see several journals are reduced to double and quad crown sizes. In England numerous publications have been dropped altogether and publishers, as well as newspaper owners, are doing their utmost to husband their paper stocks and supplies. Again, I repeat, now is Canada's time in the British market for newsprint and the price is good—money down if needed.

But while the position in England is bad for paper and pulp supplies, I learn that the manufacturers in Sweden and Norway are also in a precarious position. No exports to the United Kingdom can be undertaken owing to the mines floating on the sea route, the Germans have indiscriminately mined the route in parts, with the result that shipping is dangerous. A week has passed in Norway without an English mail arriving, and when letters cannot be delivered, it stands to reason that pulp and paper cannot be exported or imported. I also learn that Norwegians have been short of coal and mills have had to close down. This is a serious matter, but as I pen these lines it is most likely that coal is getting through to Norway, though the British Admiralty say they cannot give any reassurance that the route will be clear for any length of time. Before the war broke out the pulp markets of Scandinavia were dull and depressed, but now prices have leaped higher to the extent of 10 and 20 per cent. Norway, however, is shipping sulphite and sulphate to America and very likely some of it will find its way back in England and Scotland. All employees in Norwegian and Swedish mills—at least in most of the mills—are under notice to leave, unless there is a sudden change in the political horizon before long.

The financial question has also to be considered in Scandinavia, and the same may be said of England, Scotland and Ireland. In London the Bank of England rate rose to 10 per cent and the government is issuing as much paper money as possible. Millions of £1 and 10s. notes are in circulation. At the St. Mary Cray Paper Mill, the government stepped in and took charge of the paper—or at least that—which is of the same quality as stamp paper—and supervised the water-marking and other processes. The special wa-

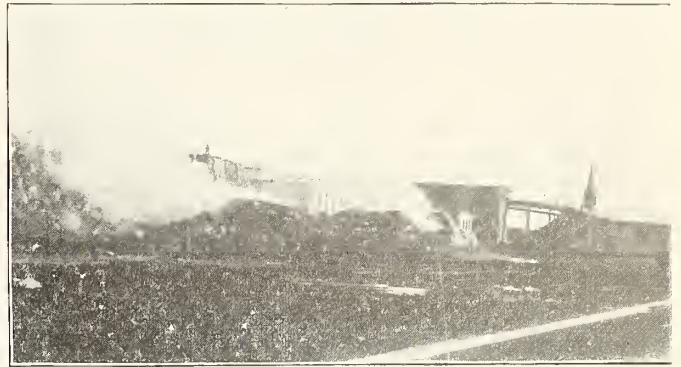
ter-mark resembles the monogram "G.R." (George Royal) at intervals of half-an-inch through the paper and the production is used for the new £1 and 10s. notes. While this was going on, the owner of the Cray Valley mill took his place in his regiment as a Lieutenant, and he is now serving his country. Indeed, many of the paper mills and paper and pulp offices have been deserted by workers who are now serving with the colors in some shape or form. The war has also caused papermaking machines in some of the British mills to be closed down temporarily.

Naturally at a period like the present the demand for paper by the government is extremely great. Some of the departments are working day and night, and the firms who hold government contracts have never been kept so busy in their lives. When the news leaked out that the relation between Germany and Great Britain were becoming strained, the daily and weekly newspapers also showed great activity and the rush for newsprint was something enormous. When it is remembered that some of the daily papers circulate up to a million copies per day, one must realise the stock of newsprint that must be stored. I counted 50 tons of newsprint one morning going into a newspaper office, and since then the rate has been on an average of 40 tons per day for a week. This is only one daily newspaper—what must the other offices be storing! Thousands of tons of newsprint have changed hands in less than a week and, of course, the British newsprint producer is reaping a nice profit, because those who deal in Scandinavian and German newsprint cannot get a supply for their customers. Up to the week ending August 8th, the supplies of pulp from various sources were large, but these will not last long owing to the great demand for paper, and it is difficult to anticipate what the next few weeks may bring, particularly as England is at war with Germany and Austria, France at war with the same nations and Germany and Austria at war with Serbia and Belgium, France and England—a complete "burst-up." Germany has been underselling the British manufacturer of paper for years past at home and abroad. And it is also a known fact that the German pulp and paper industries—in common with the remainder of her industries, such as textiles, chemicals, etc.—have been in very low water during the past few years, and in all probability this backward state of things has some bearing on the present warlike condition of the "Fatherland." The war, at all events, has paralyzed trade in Europe, and raw materials in England in the way of chemicals, such as bleaching powder, caustic soda, soda sulphate (salt cake), have jumped in prices from \$4.80 to \$9.60 extra. It will take Germany another generation to recover what has been lost in commerce in the paper and pulp industries in England and Europe and the countries the Teutons trade with overseas. What a catastrophe! Everyone in England is asking if the "Supreme War Lord of Germany" is in his sane senses, for not content with going to war with England and France—enough in all conscience to get on with—and threatening Portugal, he proceeded to add Russia and Belgium to his list. Having sent ultimatums broadcast, one can picture this over-allness Kaiser turning to his Chancellor and saying, "Hollweg, have we forgotten anybody?"

George W. Pauline, sales manager for Ritchie and Ramsay, Limited, Toronto, who has been spending the past few weeks in the Old Country, has returned home.

The Union Bag Fire

Not a small factor in the present shortage of newsprint materials was the loss on July 24th, of 10,000



tons of ground wood logs at the mill of the Gren Falls Company (Union Bag Company) at Cap a la Made-



leine, near Three Rivers, Que. Above, through the courtesy of Mr. Gustav Fornstedt, of the Wayagamaek Pulp and Paper Co., who furnished the photographs, may be seen the fire under way. After four days only a tangled mass of binding wires and some half-burned bales remained to indicate the spot where one of the greatest reserves of pulp in the country had stood.

LAURENTIDE BOND ISSUE.

On September 23rd, the Laurentide Company will hold a meeting of shareholders to authorize the issue of \$4,000,000 6 per cent bonds. The reason for the step is that the board has decided that it would be in the interests of the company that the balance of funds required for the prosecution of the work of construction of power units at Grand Mere should be provided from bonds rather than from other sources. The bonds will be 6 per cent 30-year consolidated mortgage bonds. No issue of these will be made, however until the war situation clears.

THE EUROPEAN WAR AND THE U.S. PAPER TRADE

(Special to Pulp and Paper Magazine.)

New York, August 25, 1914.

The European War caused considerable disturbance in the paper trade of the United States. The first week caused a great deal of excitement in all branches. A great deal of the nervousness found expression only in talk. Real activity and facts developed in comparatively few cases.

For the past six months the paper business has been very quiet in most lines. Prices in all grades had weakened considerably, as mills were taking orders simply to keep their machines running. Jobbers have allowed their stocks to deteriorate and they have bought only what they needed. Small orders were scarce and there was no need of carrying any great stock on hand.

Advertising has been very poor and newspapers had not consumed more than about 80 per cent of their contract supplies during the first six months. The Mexican war scare gave a temporary boom to the consumption and left a general falling off of about 2½ per cent. At the outbreak of the European war, newspapers were somewhat below their contract consumption. At this time the demands have been so heavy that they are now about ten per cent above their contract quantities. The last week or ten days have shown some notable cuts in the sizes of newspapers. Instead of 16 to 22 page editions, 12, 10 and 8 page numbers are in the majority. Transient business has been scarce from the first of the year and still is. All the activity in news has been confined to contract orders.

Most worry in the trade was regarding the sulphite situation. The tie-up in international shipping caused some rather serious difficulties with regard to the 1,000 tons a day imports of chemical fibres for domestic consumption. Importers were inclined to hold what little pulp was on dock or in transit for shipment to consuming customers. The feeling was to make a fair division of the pulp supplies here among the contract customers and clean up the supplies on hand at a fair profit. Some importers made attempts to buy up supplies of pulp on speculation and move it at fancy prices. Advances on bleached sulphite were reported anywhere from ten to thirty dollars a ton. Only small lots were sold at these advances, and then only to mills which had very low stocks at hand. After the first week or ten days importers found that paper mills were not so badly in need of sulphite that they would pay any price for it. Bleached sulphite is of interest to mills at prices ranging from 2.65 to 3 cents. In some cases even these prices are too high for consideration under the present business conditions. Unbleached sulphite has been quoted at fanciful prices, but very little was sold.

Foreign rags have been very scarce, as many suspended shipments were ordered during the past two months. Mills have fairly good supplies on hand, and are not particularly worried for the immediate future business. There is only a poor demand for fine papers, and prices are not satisfactory enough to warrant any advanced prices for stock. Importers of foreign rags

have been inclined to speculate in the domestic rags market, where packers are holding fairly good supplies of all grades at absurdly high prices. Shrewd dealers in the New York market are moving all the rags and paper stock they can at a fair profit. They are also well aware of the kind of packings that are likely to be shipped in times such as this and label all their consignments: "No rejections after thirty days can be considered. Goods bought with this understanding by mills." The dealer can put no guarantee on any rags collected now for packers have filled their warerooms with all grades and have made very poor sortings. Roofing rags, it is said, are nowhere being packed according to classification.

Bagging advanced about \$3 a ton for all grades, but very little business was done, as imports have been very light for several months past. High offers have been made by paper mills for manilla rope, which is very scarce. One offer of 4 cents a pound for a car load was made in New York.

All grades of domestic rags advanced from ½ to 1 cent a pound during the interval. Supplies in packers' quarters accumulated only because the demand for them has been very poor. Collections of rags have been very small this year, as textile mills and clothing manufacturers have been only running on part time. Their waste has been small and packers are very largely dependent upon this source for their rags. Under ordinary conditions, domestic rags cannot supply more than half the demand for rags.

The scarcity of pulp has led to demand for all substitutes of pulp. All sulphite and kraft waste papers have been in good demand. Prices went up in all grades from 10 to 20 cents a hundred pounds. Old krafts and manillas have been in unusually good demand as the raw material for both grades has been scarce.

The most notable change in the paper situation has been in the heavy movement of newsprint through contract channels to consuming centers. This was also accompanied by a heavy demand for newsprint from Australia, South America, South Africa, France and England. The early weeks saw a demand for the immediate shipment of about 12,000 tons of news to the above mentioned countries. There was no advance in price, except for English export, where it was reported the price was 2½ cents domestic ports.

Other developments in the United States paper industry were the universal withdrawing of prices and refusal to make contracts, all orders being confined to what is considered a thirty days' supply. Some manufacturers of wrapping papers advanced their prices, it was said from \$3 to \$10 a ton for orders for immediate shipment. The demand for wrapping papers has been very poor, and it was the opinion of one important factor in the trade that the best advance for any grade of wrapping was \$3 and it was also his opinion that very few of the wrapping mills would turn down an order at the values prevailing before the war began.

Ottawa Notes

Ottawa, Ont., August 25.—The outbreak of war, with its expected demand for news print and the raw material therefor, has already had its effect on prices in Ottawa. News print has gone up from \$42 to \$45 for new contracts and this price is expected to be maintained, if not exceeded, for all contracts made hereafter while the present situation endures. The demand is very good. Sulphite pulp has increased \$8 per ton and is now selling at \$44 and \$44.50. The J. R. Booth Company, which had its pulp mills put out of business for a month some time ago owing to an accident, had to purchase a quantity of sulphite pulp for which \$44.50 was paid after the announcement of war. Groundwood has gone up \$2 per ton.

Every effort is being made to expedite the completion of the new 50-ton sulphite mill at the Booth plant in anticipation of the expected demand for that product. Mr. W. H. Rowley, president and general manager of the E. B. Eddy Company, states that provided his firm can obtain certain materials needed in the manufacture of their products and which have been obtained largely from foreign countries, it will continue to operate at full time. Among the materials which are imported are certain chemicals, clays, metals, chlorides, dyestuffs, etc.

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Prospects for both the lumber and pulp and paper industries having improved considerably since the first outbreak of war, and the gloomy prophecies made at that time having been more or less discounted since, more men will probably be sent into the woods by local firms than was at first planned. The J. R. Booth firm some time ago announced their intention of sending in only 1,000 men, but are now considering the despatch of a larger force if prospects improve. Shepard and Morse have 450 men in their camps at the Kippewa and Quinze rivers, 25 more than last year. The Hawkesbury Lumber Company and McLachlin Brothers will cut about the same quantity as last year.

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The completion of a new dam and log slide at High Falls on the Lievre River, part of a scheme of conservation work which the MacLaren Lumber, pulp and paper firm of Buckingham, Que., is carrying out on that stream, is announced, and details have been given out of the work. The new dam is a large structure and is of a permanent character, designed not only to assist in the lumbering work carried on by the company, but also to develop power for which a use is hoped to be found later. About 100,000 horse power, it is estimated, can be developed. Five power flumes, each of which will provide 10,000 horse power, have been constructed at High Falls, where the river drops 160 feet, and when a use has been found for the power the water will be turned through these. Besides this a log chute has been constructed which is said to be unique of its kind. It replaces a wood structure with a capacity of 15,000 logs in ten hours, is itself built of reinforced concrete with a V-shaped trough, and can accommodate 50,000 logs in a ten-hour period, with very little overseeing. It is claimed that the chute, which was built by Mr. John B. McRae of Ottawa, is the only one of its kind in Canada, and if there is any other in another part of the world it has not yet been heard of.

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Another important work which has been carried on by the MacLaren Company for some time and has

been further extended during the year is the building of a forest telephone service. This service, which connects the head office at Buckingham with every part of the limits, also furnishes a service to the villages and towns on the Lievre. It now extends from Buckingham to Ferme Neuve and is 88 miles long. The line gives valuable aid in controlling operations in the woods and in preventing fires and is made use of by the settlers throughout the district. The MacLaren firm is also carrying on throughout the Lievre Valley a splendid work of conservation. The large limits are being surveyed by a firm of forest engineers, and when the full report of the latter has been handed in, it is believed it will be possible to devise a scheme of making the supply of wood from limits perpetual. It is believed the annual increase will easily support the annual cut of both the lumber and pulp mills. It is also planned to dam the tributary streams of the Lievre as well as the main stream and the reservoirs obtained in this manner will be used to conserve the level of the river during the late summer.

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Will an export duty be placed on Canadian pulpwood as a war tax?

According to the statement of Hon. W. T. White, Minister of Finance, made in Parliament last week, such a method of raising additional revenues for war will be taken into consideration in the future when further need for supplementing the usual avenues of taxation arises. The minister's statement was made in reply to an observation by Mr. E. M. Macdonald, Opposition Member for Pictou, N.S., who stated that a tax on fancy matches or an export duty on pulpwood would be preferable to increasing the duty on sugar as had been done. Mr. Macdonald stated that, "the cost of paper abroad might well serve the purpose of contributing to our revenue. Our great natural resources in this respect will be drawn on, particularly at this time, by reason of the extra demand for paper arising in other countries."

Mr. White's reply was as follows: "So far as an export duty on pulpwood is concerned, that matter was not under my consideration, but I shall be glad to take it into consideration in connection with any future action we may have to take for the raising of revenue of a special character connected with the war."

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The water in the Ottawa River, Gatineau and tributary streams is lower than ever, and some of the mills deriving their power from the Chaudiere Falls are already contemplating having to cease operations at an early date. It was rumored, in fact, that J. R. Booth would close down his plant shortly, but the company states that this is not the case, and that every effort will be made to continue operations as long as possible.

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As an evidence of the good that has already been accomplished by the newly-formed Lower Ottawa Forest Protective Association, to which all the pulp and paper firms in the Gatineau, Lievre and Ronge River districts belong, it is reported that the chief fire inspector of the association has since its inception had no less than 40 persons, guilty of carelessness in starting fires in the woods, convicted and fined. What promised to be an extensive fire in the Campbell and Stearns limits near Thirty-One Mile Lake, Que., recently, was promptly reported by rangers and extinguished by the staff of the association before much

damage had been done while a number of minor blazes have been extinguished.

* * *

The Canadian Trade and Commerce Department is co-operating with Canadian paper manufacturers in discovering new trade opportunities in the present war situation. A bulletin which has been issued to manufacturers from the Department this week points out that imports of paper by Britain from Germany in 1913 totalled \$2,017,575, compared with Canada's export of \$587,010 and urges that Canadian manufacturers should endeavor to capture this trade. There have been many inquiries for Canadian pulp, pulp-

wood and paper, one French newspaper in Bordeaux, France, having cabled across for supplies of news print.

The war with Germany will probably afford Canada an opportunity to improve its export to Great Britain, which as regards pulp and paper has been declining greatly during the last five years. Recent trade figures issued by the Trade and Commerce Department showed that Canadian export to Great Britain of paper not on reels has fallen from \$421,985 in 1909 to \$2,395 while the export of ground wood fell \$725,190 in the five years.

MAC.

THE USE OF PERMUTIT IN WATER SOFTENING

The question of water supply is, perhaps, the most important of all in the manufacture of paper. Every class of mill has to give earnest attention to the cleanliness and the softness of the water used, in order to turn out clean paper to keep boilers clear of scale and wires from becoming clogged. The investigations of J. F. Garret upon a new filtering agent have been watched with great interest in the United States. In an address before the Illinois Water Supply Association, quoted in "Water Supply," Mr. Garrett sets forth his ideas.

The chemical used is called permutit. It is an artificial zeolite recently produced and patented by Dr. R. Gans of the Royal Prussian Geological Institute of Berlin. The use of permutit is comparatively new and its commercial possibilities have been investigated only to a small extent. It is prepared by smelting aluminum silicates with sodium carbonate and sand and washing out excess of sodium carbonate with water. Its chemical formula is $2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{O} + 6\text{H}_2\text{O}$.

The most important characteristics of this compound are:

1. **Its property of interchanging bases.** This property is very significant, for by replacing the sodium base by other bases it is possible to make a permutit of almost any metallic combination. The exchange of greatest interest, however, is the exchange of sodium for calcium or magnesium by which the hardness of water can be reduced to zero. The iron, manganese and organic matter can also be removed from the water through this property of interchanging bases.

2. **Its property of regeneration.** Upon passing hard water through permutit, the sodium content of the latter will eventually become exhausted, being replaced by the calcium and magnesium contained in the water, hence it is necessary to regenerate the permutit. This can be done by passing a 10 per cent solution of common salt (NaCl) through the permutit.

3. **Its length of life.** It is claimed that permutit can be regenerated an unlimited number of times without loss, hence it is never necessary to renew the charge in the filter.

The permutit filter consists of a steel shell made in various sizes for the treatment of various quantities of water. This shell is fitted with pipes and valves in order to give the necessary mechanical treatment to the water and also to enable washing and regeneration with a salt solution. Inside this shell a layer of permutit is placed between two layers of gravel,

through which the water to be purified is passed at a comparatively rapid rate. During its passage the calcium and magnesium salts react with the permutit, turning the sodium permutit into calcium and magnesium permutit.

This process differs from most water softening processes in that an excess of insoluble reagent is used instead of a small amount of soluble one.

Permutit may be used in practice in two forms, namely: (1) sodium permutit for the removal of calcium and magnesium and (2) manganese permutit for the removal of iron, manganese, and organic matter. The sodium-permutit is perhaps of greatest commercial importance because of the large number of industries that require water free from calcium and magnesium. The sodium-permutit filter will reduce the hardness of almost any water to zero, at a very low cost. Hence the advantage of permutit-treated waters for boiler purposes, dyeing, bleaching, and laundry work, are undoubtedly very great.

The manganese-permutit is prepared by passing MnCl_2 through sodium permutit and then washing with calcium or potassium permanganate. This treatment forms the higher oxides of manganese which cling mechanically to the granules of permutit thus exposing a very large, highly oxidized surface, which will remove the iron, manganese and organic matter from the water.

The essential difference between the action of the sodium-permutit and the manganese-permutit is, that in softening water by sodium-permutit the substances eliminated from the water actually enter into combination with the permutit and consequently there is no precipitation and no clogging up of the filters but in the manganese-permutit the oxidizable substances in the water are actually precipitated and tend to clog up the filter.

The regeneration of the sodium-permutit filter requires about eight hours. A 10 per cent salt solution is run into the filter and let stand for about six hours, after which it is drained out and the filter washed. The filters must be regenerated once every 24 hours. This can be done at night, enabling the filter to be used every day. The capacity of the filter does not deteriorate with use that is, the capacity of the filter at the end of a year's run is the same as at the beginning. Hence, after the cost of installation, the only expense is the cost of salt for regeneration, which in this section of the country is about 2c per

thousand gallons of water of 350 p. p.m. (CaCO_3) hardness. Of course, the cost of salt will vary in different localities which will cause variations in the cost of treatment.

In order to regenerate a manganese permutit filter it is necessary first, to break up the filter bed and wash out the accumulation of iron oxide, etc., that has been oxidized and precipitated in the filter. After this has been done, the filter is reoxidized by means of a solution of calcium or potassium permanganate.

Mr. Garrett made a number of analyses of tap water before and after treatment with sodium-permutit. In making the analyses he used the "rapid boiler" method which is used in the State Water Survey laboratory. The following results are the average of twenty-five analyses, and serve to show the comparison between the treated and untreated water. The results are expressed in parts per million:

	Na_2CO_3	Alkalinity as (Methyl CaCO_3 Orange)	MgCO_3	CaCO_3	Na_2CO_3
Untreated water	82	348	102	145	87
Treated water	388	399	000	12	412

The presence of 12 p. p. m. CaCO_3 is doubtless due to the presence of CO_2 in the untreated water, which drives the reaction toward CaCO_3 instead of Na_2CO_3 . ($2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{CaO} + \text{Na}_2\text{CO}_3 = 2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{O} + \text{CaCO}_3$.) However, CO_2 can be easily removed by passing the water over limestone.

The following brief abstracts show the possibilities of the use of the process in practice in a few industries.

Basch in an article on "The Use of Permutit to Purify Boiler Feed Waters," states that the presence of alkali in water prevents the corrosion of iron but causes foaming and that the presence of NaCl counteracts the effect of alkali. Hence waters treated with permutit cause foaming and yet do not prevent corrosion because of the presence of small quantities of NaCl . However, other writers state that at least fifty boiler plants in Germany and over one thousand in Germany, France, England, and the United States are employing this system of treatment and none of them have had any trouble with corrosion, scale, or foaming, since this process was introduced.

It is claimed that for dyeing and bleaching purposes, water treated by the permutit method is equal to distilled water and is much cheaper.

The use of permutit for laundry purposes has many advantages over the lime and soda process. Water cannot be softened to less than $3\frac{1}{2}$ grains per gallon or 60 parts per million (CaCO_3) hardness by the lime and soda process, while it can be softened to zero by means of permutit. The cost of treatment is approximately the same with either method. The permutit-treated waters also contain a considerable quantity of bi-carbonates which aid in cleansing and are ordinarily added to waters used for laundry purposes. Another important advantage of the permutit filter for laundries is that it automatically adjusts itself to waters of varying degrees of hardness. The mechanical adjusters used on lime and soda softeners are efficient for a short time, although they require constant attention, but the action of the lime soon throws the gears out of adjustment and hence the water is not properly treated. All these difficulties are avoided in using a permutit softener.

Some of the advantages claimed by H. G. Anders for the use of permutit are:

1. "Any water may be softened to any degree of hardness by regulating the flow"
2. "The filter works automatically."
3. "Variations in the feed water do not affect the filtrate."
4. "The number of regenerations of the filter is unlimited."
5. "Iron, manganese and organic matter may be removed by using manganese-permutit."
6. "The process may be used in other industries; for example, to recover potassium from the waste of sugar refineries."

From further investigations, Mr. Garrett has determined:

1. That calcium and magnesium can be completely removed from tap water in which they occur.
2. That iron can be removed from the water by passing through sodium permutit in the presence of air.
3. That the normal rate of flow (33 gals. per hour) can be nearly doubled without affecting the quality of the filtrate.
4. That the filter can be completely regenerated.
5. That there is a small loss of permutit in washing the filter. However, this loss is purely mechanical and by exercising a little care in flushing can be reduced to a minimum.

Although there has been, up to the present time, very little investigation of permutit, however, the results obtained both in this country and abroad all show the high efficiency and low cost of treatment of this method of water purification and point toward a large industrial application of the process in the future.

THE PRICE OF WAR.

While English exporters are striving to live up to the motto "Business as usual," all reports indicate that the paralysis of Germany's oversea trade is complete.

German manufacturers, who have travellers all over the world, cannot execute orders or fulfil contracts. Thousands of customers for German woollen goods, chemicals, hardware, machinery, and silk and fancy goods in the British Colonies and in South America cannot now obtain supplies.

The commercial campaign which Germany inaugurated a few months ago in oversea markets has, therefore, ended in a fiasco.

The war leaves England and the United States the only competitors in the field, and the longer the struggle lasts the more complete must be the wreckage of Germany's hopes of industrial expansion.

In the Far East and in India she is also threatened with severe losses.

"One of the German trades that will be hit very hard indeed," said the manager of Messrs. Raphael Tuck and Sons to-day, "is printing. The value of Germany's trade with India and China in lithographic and color printing is enormous.

"She prints postcards and posters for both countries by the ton, and has been able to undersell English competitors.

"Our own representatives have been brought face to face with German competition in all parts of the East, so that I can speak with authority upon it.

"In India there has been a big demand for cheap German prints, especially pictures of Buddha, but one consequence of the war will be that these pictures in future will be purchased in England."

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

A negotiation was made last week at Watertown, N.Y., whereby the control of the St. Regis Paper Co. was transferred to G. H. P. Gould, the president of the company. The 4,607 shares of D. M. Anderson, general manager, were assigned to Mr. Gould, who, with George C. Sherman, now control the interests in the company. Just how much money was involved in the transaction has not as yet been announced.

The shares of stock held by Mr. Anderson were both preferred and common. The preferred stock has always sold at about par, while the last sales of the common brought fifty. It is not known whether Mr. Anderson contemplates retiring from active business, and he is on an automobile trip at the present time, so could not be seen. He still retains his interests in the Taggart Paper Company.

The St. Regis Paper Company owns mills at Deferiets, Herrings and Black River. The one at Deferiets is a four-machine plant with a capacity of about one hundred and twenty tons daily.

The mills at Black River and Herrings were purchased only a short time ago from the Jefferson Power Company. Paraffine paper is made at the Black River mill and wrapping paper at the Herrings mill. Each has a capacity of twenty tons daily. The company also has very valuable timber holdings in the Adirondacks, with a valuable asset in excellent water power.

The St. Regis Paper Company was organized about fifteen years ago. G. H. P. Gould, of Lyons Falls, has been president of the company; George C. Sherman, of this city, treasurer, and D. M. Anderson, general manager. Mr. Gould is also heavily interested in holdings at Donnacoma, below Quebec, and in the Gould Paper Company at Lyons Falls.

Until this deal was executed, Mr. Anderson and Mr. Sherman were the two heaviest stockholders in the St. Regis Paper Company, owning over one-half the total number of shares. While no final action has been taken in the matter of a general manager of the St. Regis company, it is believed that J. Victor Baron, who has been assistant general manager for some time, will be appointed in Mr. Anderson's place.

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Paper manufacturers in the vicinity of Portland, Me., had an opportunity of seeing during the past fortnight the travelling exhibition of paper sent out by the Department of State at Washington. The exhibition has collected by the department after consulting its consular officers everywhere in regard to the paper business in their respective localities with a view to discovering what kinds of paper are used, and what kinds are not used, and what opportunities exist for American manufacturers to fill in the gaps. With the reports, were sent a large number of samples, and these have been arranged as an exhibit. There are more than 250 samples of all kinds and styles of papers used for every purpose and made in all sorts of places.

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The Writing Paper Manufacturers' Association, of which Clifton A. Crocker is president and Emmet Hay

Naylor is secretary, held a meeting in the Hotel Kimball, in Springfield, Mass., several weeks ago, there being twenty-seven concerns represented. The certainty of the future supply of imported raw materials, and the demand on the part of some jobbers to have large future orders immediately filled at present prices, led to this meeting to consider the state of trade, and resulted in a withdrawal for the time-being as a natural measure of safety, of the present price-schedules. Under this decision, prices will be governed by current conditions. It is not contemplated that any marked advance will immediately take place; but the effect of the European war will be watched closely, and prices must determine themselves by events as they materialize.

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Under a decree of foreclosure entered recently at the federal building in Madison, Wis., the property of the Brunet Falls Manufacturing Company, located at Cornell, Wis., was sold August 10 at public auction, the sale taking place at Chippewa Falls, the county seat in which the village of Cornell is located. The property was purchased by the Cornell Woods Products Company, which is a reorganization of the defunct Brunet Falls Manufacturing Company. It was bid in at \$1,500,000. Frank H. Jones, trustee under bonds, was the plaintiff, and George C. Holmes served as special master at the sale. Chauncey O. Frisbie, of Cornell, who was appointed receiver some months ago, will be manager of the plant, which will continue the manufacture of wood pulp materials.

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The Economic Power and Products Company, Philadelphia, is in receipt of many letters from boards of trade, chambers of commerce, etc., of various cities in the cotton belt requesting that it locate its first mill in their respective cities, many of them offering attractive inducements, including free sites, exemption from taxes, etc. A committee of the company will go south in the near future to look over some of these locations and decide which is the best adapted to their requirements.

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The Albany Paper Company, paper manufacturers of Albany, N.Y., has been taken over by the Albany Paper Products Company, which was recently organized. The officers of the new company are J. S. Cline, president, A. M. Shepard, Vice-President; J. A. Fletcher, superintendent of the Albany Paper Company, will remain with the new concern in the capacity of superintendent. J. S. Cline, president of the newly incorporated company, is a member of the firm of J. S. Cline and Co., 19 South LaSalle Street, Chicago, and it is stated that it is the plan to remodel the mill at Albany, and in addition to install a box and carton plant to provide facilities for conducting the business of the Fletcher and Federal Paper Box Companies, thereby effecting a combination of three concerns.

It is understood that the consummation of the deal is due to the efforts of C. A. Chapman, president of C. A. Chapman, Inc., the paper mill engineers of Chicago.

Advices from California state that the Northern part of the state will shortly have one of the largest mills in the West, and the bark and waste wood of the redwoods is to be used in manufacturing all the various kinds and qualities of paper. Articles of incorporation of the Redwood Paper and Pulp Company have been filed with the Secretary of State, with George Hasman, George P. Brown and Walter C. Ives as the incorporators. The principal place of business is to be in Eureka, Humboldt county, the redwood center of Northern California. The capital stock is fixed at \$500,000, part of which is actually subscribed.

In recent years experiments have been made with the redwood waste and especially the bark of the gigantic sequoia, which were satisfactory and indicated that at small expense the great slabs of wood now destroyed annually in the logging camps could be utilized in manufacturing a cheaper and better grade of paper for all commercial purposes.

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An important change has been made in the method of operating the Franklin, N.H., plant of the International Paper Company. Superintendent George M. Dunham has taken full charge of the plant to manage every detail. Heretofore much of the business of the mills, including many minor details, have been supervised by the New York office in conformity with the system by which the many mills of the corporation are managed throughout the country. The new scheme of a resident manager to handle the entire business of a plant is a sort of an experiment being tried for the first time at the Winnipeg sogie mills. There is a belief that the scheme may be put in operation at other plants, if it works out satisfactorily.

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The tale industry of northern New York is not expected to suffer on account of the shutting off of the exportations to Europe, but officials express the belief that prices will improve. The tale mines near Gouverneur, N.Y., have shipped large quantities abroad for use in the manufacture of paper there, but it is claimed that the increased demand for paper in this country will more than make up for the loss of the foreign trade. The mills are only shipping to South America now, but some hopes are held out that Great Britain will eventually be able to re-open the high class seas to international commerce.

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The trustee of the Battle Island Paper Co. of Fulton, N.Y., have made arrangements for the sale of the large wood lands of the company in Eastern Canada, which for many years produced supply of pulp wood papers, transferring the properties to the Ontario Paper Company of Canada, will be executed shortly. The amount specified in the deal is \$300,000.

Charles N. Bulger one of the trustee, returned last week from Chicoutimi, where a meeting of the Canadian creditors of the Battle Island Paper Company was held, at which claims were filed and arrangements for the sale were made. The Supreme Court of Quebec will issue an order turning over the property to the Ontario Paper Company.

The sale will include 27,000 acres of wood lands owned outright by the Battle Island Company, 100,000 acres of Crown Limits lands controlled by the company, a rossing plant at Ha Ha Bay, and \$26,000 worth of pulpwood ready for shipment. For every cord of wood taken from the Crown Limits lands the Battle Island company was compelled to pay a tax of 65 cents to the Canadian Government.

The next step to be taken in the case is the disposition of the company's plant.

Mr. Bulger stated that at least \$800,000 should be realized from the State for the power rights. The trustees are also ready to dispose of the paper plant, the appraised value of which is \$400,000.

With the sale of the Canadian properties, after the claims have been paid, about \$165,000 will be left for the bondholders. There will also be the proceeds from the sale of the Battle Island plant together with whatever is obtained from the State for the destruction of the water power. The outstanding bonds of the company amount to \$500,000.

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On Tuesday and Wednesday of last week the domestic sulphite manufacturers held a meeting in the rooms of the American Paper and Pulp Association in 18 East 41st New York. The general feeling among manufacturers was against taking advantage of the present wood pulp shortage. Conservative advances of from five to ten per cent were said to have been made. Spot orders for unbleached sulphite could probably be satisfied at prices ranging from \$39 to \$43 a ton at the mill. No contracts will be made at any price. The feeling among manufacturers is that no one is willing to load up at these figures, as they would prefer to await a settling condition.

The Commercial Envelope and Box Company of Binghamton, N.Y., which was recently partially destroyed by fire, has re-opened, and a force of more than 75 employees have been put back to work. The entire interior of the factory has been repaired, new machinery has been installed and new floors laid. The interior construction has been reinforced by steel and new timber.

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In about two weeks it is expected that the new paper making machine being erected in the plant of the Northern Paper Mills of this city will be ready to operate, and will be turning out paper about September 1. There has been a short delay in getting the big machine erected. It was expected that it might be running this week. Other smaller machines, such as rewinding machines, and printing presses, have been installed in the finishing department of the building just completed. The big addition is ready to use now. Just as soon as the new machine is set in motion and paper is manufactured, the equipment for finishing the product will be made use of by the company.

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The lower mill of the Crane Brother's Paper Company in Westfield, Mass., is running on a four days a week schedule for the remainder of the month. One hundred employees are affected by the change, which is expected to be of short duration.

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The State Commissioner of Corporations has granted a charter to the Inland Paper Company of Adams, Mass., to engage in the paper business. The capital stock of the new corporation is placed at \$40,000, represented by 150 shares of preferred and 250 shares of common stock, each share having a par value of \$100. Henry L. Harrington of Adams is the president of the corporation, William W. Chatterton of Chicago vice-president and Francis R. Harrington of Adams is treasurer. These three men form the board of directors of the corporation.

BELGO DEVELOPMENTS.

The photographs below give practically a panoramic view of the construction at the Belgo-Canadian works at Shawinigan Falls. Between the right hand side of the upper view and the left-hand side of the lower, a

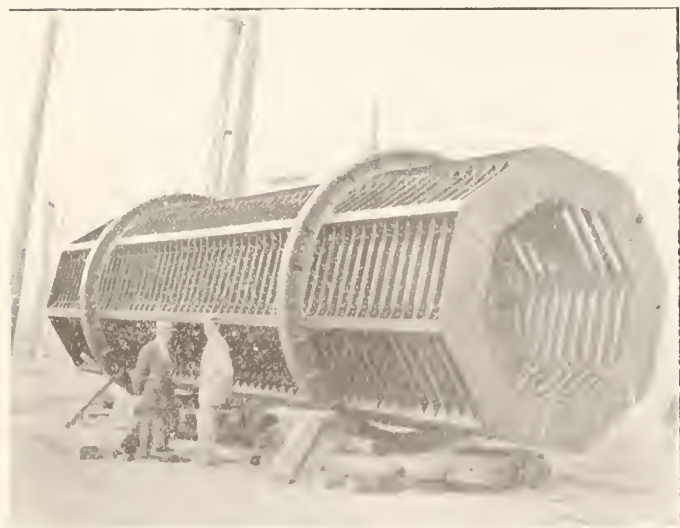


narrow hill occurs. In the pictures from left to right may be seen the old machine room, wood room, new machine room, new sulphite plant (behind) new screen room machine shop and administration offices,



conveyor from slasher mill (in foreground), wood stack and conveyor, at right angles to one shown above.

The third picture is of the new 40-foot barking drum which is to be installed. Inside the drum, which con-



sists of long narrow plates riveted to the steel frame, may be seen the worm flange, which directs the sticks from one end to the other.

ENGLAND AND WOOD PULP.

Improved Forestry Might Save Her \$180,000,000 Yearly.

The huge sum of \$180,000,000 annually is what the report of the State Forestry Branches says can be saved in England if only the forests were properly developed and their products turned into wood pulp. It is known that there are very large areas of uncultivated land which would produce better results financially from the growth of timber than from the present methods of utilization. The total value of timber and wood pulp imported into the United Kingdom in 1912 was over \$180,000,000, of which certainly more than 80 per cent was derived from coniferous timber, or pine trees.

This, continues the report, is precisely the type of timber for the growth of which the waste land of the country is best adapted. Moreover, with regard to the settlement of a larger population on the soil, in a grazing estate the amount of employment is increased by about 60 per cent on beginning afforestation operations. The report says in conclusion:—

"Gradually as the plantations fall to be thinned and the produce converted the increase must become much greater. The total area of woodlands in England and Wales is 1,884,000 acres. Over 95 per cent of this is privately owned, and it is probably producing not more than one-half its maximum yield. It is not possible to make an accurate estimate of the value of this property, but a conservative estimate would be between £25,000,000 and £30,000,000. The improvement of existing woodlands is an important matter. If it were possible to raise the production by even 10 per cent an effect equivalent to the afforestation of at least 100,000 acres would be obtained.

"Aside from the fact that timber is likely always to be considered the most suitable material for most of the purposes to which it is now put, recent years have seen it adapted for a number of new purposes. The wood pulp industry is still capable of extensive development in this country, and it may be anticipated that wood will be still more largely used for the purpose of paving."

BELGO'S MACHINE DELAYED.

It is rumored that progress in construction at the plant of the Belgo-Canadian Company at Shawinigan Falls has been interrupted by the war, through the action of the British Government in taking over the Walmsley works in England for cannon-making. The big 202-inch machine which was being rushed to completion has been side-tracked, it is understood, for eighteen months. In this case, Belgo will not go ahead with the new sulphite plant, of which one digester shell has been practically completed, and the other is well under way. Mr. Biermans, the manager, went to Belgium a little over a month ago, and considerable anxiety is felt, as he has not been heard of since. It is quite possible that he is in the thick of hostilities. It is not known just when advance will be made with the plant. Mr. Stattler, the chief engineer, is working incessantly to keep things moving properly under the altered conditions.

George H. Millen, of the E. B. Eddy Co., Hull, spent a few days recently in a motor tour of Ontario visiting the agencies of the company in Toronto, Hamilton, London and Windsor.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

The European war has placed many of the British paper mills in difficulties, but up to the present there is no fear of a paper famine setting in, as there is a fair supply of pulps on hand. The Lancashire mills are about the worst off, so much so that one concern had to pay \$18 for a ton of ground wood. These mills in Lancashire are hoping that Canada will put pulps on the market, but many of the managers believe that the Dominion producers are finding it difficult enough to keep up the supplies for the domestic and States consumption. The Sittingbourne paper mill in Kent, which is owned by Edward Lloyd, Ltd., has lost close on to 100 men who have joined the reserve, territorial and naval forces. Provision is being made for the families by Mr. R. D. Bell, the manager, by direction of the firm, who have taken things in a patriotic way. Though the mills in Scotland have still a supply of Esparto grass on hand, it is greatly to be feared that in the near future there will be difficulties in replenishing the supplies, as the German gunboats have been bombarding ports where esparto is shipped from, and then there are also difficulties in securing reasonable freightage. Esparto prices have advanced by \$3 to \$4—prices that are really beyond the pockets of papermakers. There is now some talk of increasing the prices of newspapers in London and the provinces, owing to the high cost of newsprint. A great deal will depend what the next few weeks may bring forth, but at present the outlook is gloomy. Some military men say the war may last 12 months, or even longer.

The death of Mr. John Galloway has occurred. He was managing director of the Guard Bridge Paper Mill Co., Ltd., whose mill in Scotland has a world-wide reputation for the production of esparto papers. Anything that Mr. Galloway did not know about esparto, or esparto paper production, was not worth knowing. He was 73 years of age and 40 years ago he joined the mill of the Guard Bridge Paper Co., the original capital of which was \$217,000. To-day the capital is equal to \$1,152,000. There are five machines in the mill, and the output is 250 tons of paper per week. Before Mr. Galloway died he had a scheme prepared to bring the mill more up-to-date, by installing electricity. This scheme consisted of six large Babcock boilers of 200 pounds pressure, which are now working, and two 2,000 K.W. turbo-generators for generating the current to drive the mill, one of the turbos to stand-by, as it only requires one to supply the necessary electricity. The turbines are arranged with a bye-pass for tapping the steam to be taken to the grass boilers for boiling purposes, and, also, for drying purposes, etc., whilst the steam not required passes on through the lower stages of the turbine and thence to a Moirless Watson condenser. The pressure the steam is drawn off at is 50 pounds.

Canadians must not lose sight of the openings that will shortly occur in the British Dominions and Colonies for paper and pulp. Australia and New Zealand consume large supplies of newsprint, and so do the Indian possessions. I learn that the tariff on paper boards are under revision in Australia at present and Mr. N. McIntosh, manager for Carmichael

and Co., who are representatives of the Wayagamach Pulp and Paper Co., Three Rivers, Quebec, has applied for a preferential duty on kraft paper manufactured in Canada. He wants a duty the same as that enjoyed by the British mills, and no doubt he will get it. Paper manufacturers or pulp men who want information on tariffs or information as to how they may extend their business in the colonies of Great Britain should not hesitate to consult the Pulp and Paper Association of Canada, who in turn should be able to obtain the necessary details from the Colonial Office in London, through the Dominion Government. Tariffs want watching now, and so do the openings in the various markets.

A large representative company of newspaper owners, shippers, and paper men met at the Donside Paper Mills the other day to inaugurate the starting up of a new fast-running paper machine, which has been built by Charles Wahnsley and Co. Ltd. The machine is 122 inches wide and made for newsprint production at the rate of 600 feet per minute. It is housed in a granite building 300 feet in length by 50 feet in breadth. Attached to this machine room is another room 250 feet in length by 30 feet, which is used as a store for paper and close by is a beater room 60 x 62 feet.

The eighteenth annual meeting of A. M. Peebles and Son, Ltd., was held in London, Mr. George J. Maddock (president) in the chair. It was reported that owing to the continued serious increase in the cost of producing paper, together with labor troubles at the mills, the profits had been seriously affected during the past year. The gross profit is only £120. Adding the sum of £1,158 brought forward, there is a total of £1,287, which is to be carried to the next account. No dividend is, therefore, to be paid on the 5 per cent preference shares, which on the last occasion received 2½ per cent, bringing the interest up to December 31, 1912. The president, in his address, said coal had not dropped two cents a ton, and then they had to contend with the failure of Hassan and Co., who were under contract to supply the company with over 11,000 tons of esparto grass. The price of grass jumped in one single day \$4.80 per ton and even now there was a great shortage.

The government returns, issued by the Trade Board, show an increase in the imports of paper and boards and cards during July and a decrease in the exports of the same materials from British mills, the figures are:

Imports in July.			
1913.	1913.	1914.	1914
Cwts.	£	Cwts.	£
1,207,370	706,292	1,264,614	739,730
Imports—January to July.			
Cwts.	£	Cwts.	£
1913.	1913.	1914.	1914
7,406,070	4,392,925	7,291,357	4,406,513

No particulars of Canadian papers are given, but Newfoundland shipped 243,725 cwts. of printing paper on reels in reels, compared with 141,867 cwts. in July 1913, or a total of 377,848 cwts. for seven months as against 373,895 cwts. in 1913. Supplies of reel and

coated papers from the States also show very substantial increase in July.

* * *

The exports of paper from the British mills are again down. In fact they have never recovered practically since September last and it will be some months yet before a satisfactory return is shown. The figures for July are:—

Exports in July.			
1913.	1913.	1914.	1914.
Cwts.	£	Cwts.	£
333,365	334,433	275,363	279,928
Exports—January to July.			
1913.	1913.	1914.	1914.
Cwts.	£	Cwts.	£
2,108,986	2,223,261	1,979,316	2,032,378

These figures show the low state the British mills are in. To Canada, writing paper was exported to the extent of 274 cwts.; compared with 511 cwts. in July 1913. The total for the seven months is 2,321 cwts. as against 3,904 cwts. in 1913. Canada took 5,486 cwts. of printing paper, compared with 12,180 cwts. in July, 1913. The seven months' total being 52,876 cwts., as against 80,122 cwts. in 1913. These papers are mostly of high-class. Exports to the States also decreased.

* * *

The imports of wood pulp in July into the United Kingdom from all countries were as follows compared with the corresponding periods in 1913:

Imports in July.			
	1913.	1914.	
	Tons.	Tons.	
Chemical Bleached Dry...	1,363	1,341	
Unbleached dry...	29,693	33,543	
Chemical, wet...	370	2,317	
Mechanical, dry...	709	1,038	
Mechanical, wet...	51,153	69,647	

Imports—January to July.			
	1913.	1914.	
	Tons.	Tons.	
Chemical Bleached, dry...	12,095	8,135	
Unbleached, dry...	187,775	183,902	
Chemical, wet...	9,213	9,469	
Mechanical, dry...	4,766	3,156	
Mechanical, wet...	301,867	300,015	

The imports of mechanical wet (or ground wood pulp) is detailed as follows:—From Canada 17,870 tons (compared with 2,481 tons in July 1913, or a total of 41,393 tons from January to July, as against 29,116 tons in 1913); Norway, 25,564 tons (compared with 24,910 tons in July 1913, or a total of 182,534 tons for seven months as against 198,019 tons in 1913); Sweden 13,926 tons (compared with 16,569 tons, or a total of 56,205 tons compared with 58,664 tons for the seven months in 1913). The grand total is 107,886 tons in July, an increase of 64,598 tons over July 1913. It will be seen from these figures that the supply of pulp from the Dominion is gradually increasing, and, therefore, the market in the United Kingdom should be studied very carefully in order to capture more of the contracts which are usually of 3 and 5 years duration.

J. E. Dennie is now in charge of the Toronto office of the Continental Bag and Paper Co., succeeding A. Paquet, who has resigned. Mr. Dennie has been on the selling staff for some time, and was formerly employed with the F. N. Burt Co., Toronto.

HENRY D. EDDY.

The sudden death of Henry D. Eddy, a former well known Kalamazoo paper manufacturer, but more recently the president and general manager of the Morris Fibre Board Company, Morris, Illinois, in the Grand Pacific Hotel in Chicago, on Friday, August 7, proved a great surprise to his friends and associates in Kalamazoo. Mr. Eddy, who was only 39 years old, had been in fairly good health, but when found in his room at Chicago, there was every indication that he had taken an overdose of medicine. He was dead when attendants at the hotel reached his bedside.

Mr. Eddy was born in Kalamazoo and after attending the public schools for a time, became an employe of George Bardeen, the well known Otsego paper manufacturer. He showed remarkable ability in the paper business, and soon became regarded as one of the best paper makers in this part of the State. After serving a number of years with Mr. Bardeen, he came to Kalamazoo and entered the services of the Bryant Paper Company. He remained with the Bryant Company until a few years ago when he was made treasurer and became one of the owners of the Eddy Paper Company at Three Rivers, Michigan. Previous to his advent in Three Rivers, the company was known as the Three Rivers Paper Company. Under Mr. Eddy's personal management it rapidly increased its business and the company soon took over the mill at White Pigeon, Michigan, located but a short distance from Three Rivers. Mr. Eddy managed both of the mills most successfully.

About a year ago he became interested in the Morris Fibre Board Paper Company of Morris, Illinois, and moved to that place, resigning as manager of the Three Rivers company, although retaining his financial interests in the company. It is reported that the venture in Illinois, was proving an exceptionally good one under his management. Mrs. Eddy survives. There are no children. At this time no plans have been announced for the funeral.

WILLIAM J. M'CAFFREY.

William J. M'Caffrey, Treasurer and Manager of the Lake Champlain Pulp and Paper Company passed away on Sunday, the 23rd instant in the Presbyterian Hospital, New York City. The trouble was hardening of the arteries and he died of angina pectoris. In his demise the pulp and paper industry of the Eastern states loses a staunch and respected member.

TO RELIEVE DISTRESS.

There is a proposal afoot in Canada to have the Governments of Ontario and Quebec engage those who may be forced out of employment during the coming winter as land clearers in the northern parts of the two provinces. In this way distress would be relieved in the cities, agricultural areas would be opened up, and pulp wood would be provided for manufacturers.

PROGRESS MEETING.

The East Canada Power and Pulp Company bondholders will meet on the last day of August to decide what shall be done to protect and further their interests. This meeting will have laid before it all the affairs of the company since its inception in 1910.



NEW PATENTS



PAPER-WINDING MECHANISM.

Samuel M. Langston, Camden, New Jersey, Patented July 28, 1914, in the United States Patent Office.

This invention relates to certain improvements in winding mechanism for sheet material and more particularly to that type in which the roll upon which the paper or other sheet material is being wound is supported between parallel rollers so that the axis of the roll may move as the diameter of the roll increases.

In a common type of winding mechanism of this character it is customary to provide two parallel supporting rollers and a pressure roller above the roll of material and pressing the latter down upon the two supporting drums or cylinders.

My invention relates particularly to the means for controlling the operation of this pressure roller, and one object is to insure the maintenance of the desired parallel relationship of the pressure roller and the two supporting rollers so that if a comparatively narrow strip of paper is being wound, the pressure roller will act equally at each end of the roll of paper even though the latter be closely adjacent to one end of the winding mechanism.

In order to wind the paper sufficiently tight and form the roll of the desired hardness it is necessary that the pressure roller exert a considerable force upon the roll of paper and another object of my invention is to permit the accomplishment of this result without the necessity for employing a pressure roller of great mass.

It often happens that the paper along one edge portion will run slightly thinner than at the opposite edge, so that the roll will not wind as tightly at the end where the paper is thinner as at the other. To overcome this I so mount the pressure roller that during the winding operation the opposite ends of the pressure roller will rise simultaneously and to the same extent, the roller moving in parallelism, but provide means whereby one end of the roller may be slightly raised or lowered in respect to the other so as to insure the application of uniform pressure at opposite ends of the roll of paper being wound.

Other objects and advantages of my improved construction will be pointed out hereinafter and the novel features defined in the claims.

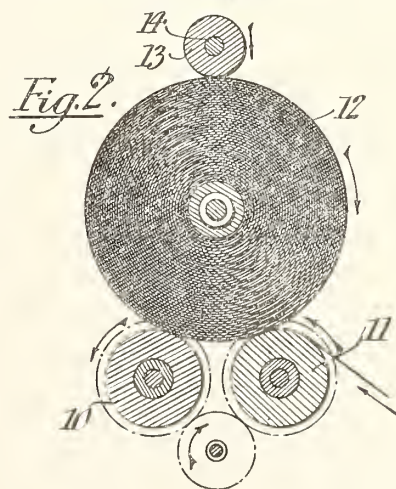
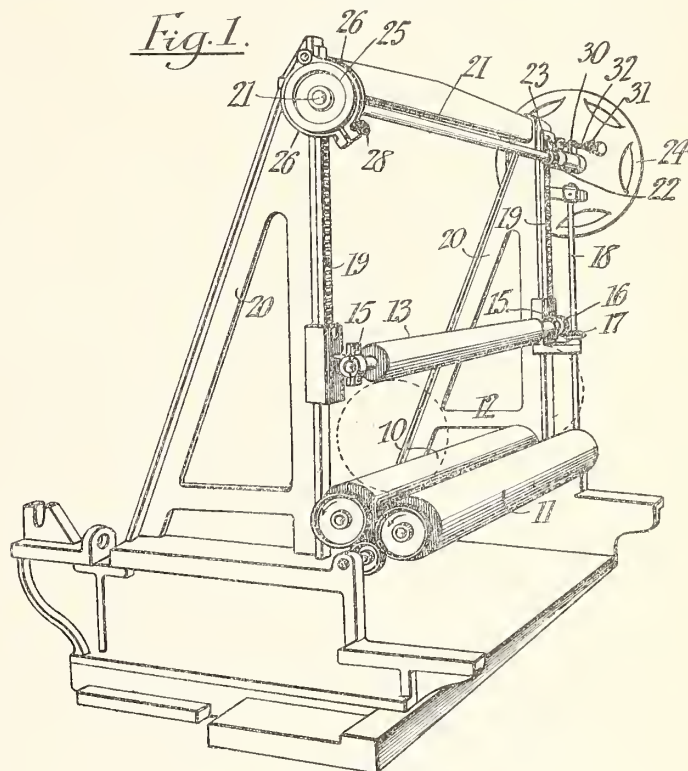
Reference is had to the accompanying drawing forming a part of this specification, and in which similar reference characters indicate corresponding parts throughout the several views.

Figure 1 is a perspective view of the upper portion of a machine embodying my invention; Fig. 2 is a transverse section showing relationship of rollers and paper roll; Fig. 3 is a vertical, longitudinal section through the mechanism illustrated in Fig. 1; Fig. 4 is an enlarged end view of the upper part of the machine; Fig. 5 is a transverse section on the line 5-5 of Fig. 3; and Fig. 6 is a sectional detail corresponding to Fig. 5, but showing a slightly modified adjusting mechanism.

My invention is applicable to slitters and rewinders of the general type shown in previous Patents 1,009,756 and 1,009,757, although it may be utilized where it is desired merely to rewind the paper without slitting or with merely a trimming of the edges of the paper. The

principle of operation whereby the paper is wound on the roll with the desired degree of hardness is substantially the same as that employed in my two previous patents, above referred to, and therefore, it is not thought necessary to illustrate or describe this part of the machine except in a general way.

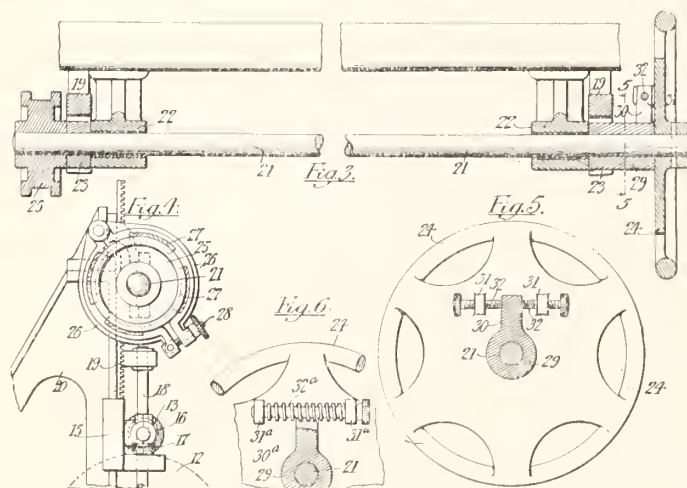
In the machine illustrated there are employed two substantially parallel cylinders or friction rollers 10



and 11, mounted to rotate in the same direction and at the same speed and to support the roll 12 upon which the paper is being wound. Above these friction rollers is a pressure roller 13 mounted to move vertically on suitable guides as the roll of paper 12 increases in size and rises.

My invention as previously stated relates particularly to the means for controlling the operation of the

pressure roller 13 and facilitating the adjustment of the latter. In the specific mechanism illustrated which constitutes merely one embodiment of my invention I mount this pressure roller upon a shaft 14 journaled in suitable vertically movable bearings 15 at opposite ends of the machine. One end of the shaft carries a beveled gear 16 meshing with a beveled gear 17 keyed to and slidable on a vertical guide shaft 18. The beveled gear 17 is supported between guides carried by one of the bearings 15 so that as the bearings move vertically the beveled gears will at all times remain in mesh and the pressure roller may be rotated upon the rotation of the shaft 18. Each bearing 15 has rigidly connected thereto a vertically disposed rack bar 19 slidable in the frame 20 of the machine and at the upper end of the machine a shaft 21 is mounted in bearings 22 and is provided with gears 27 meshing with the two racks 19. As the two gears are normally rigid with the shaft, the rising of one end of the pressure roller 13 will cause a vertical movement of the corresponding rack bar, a rotation of the shaft 21, and a corresponding rising of the other rack bar so that any vertical movement of one end of the pressure roller is accompanied by a corresponding vertical movement of the opposite end. The pressure roller thus in rising as the roll of paper increases in diameter remains at all times in



parallelism with the two friction supporting rollers 10 and 11. In case a comparatively narrow roll of paper is to be wound and this be placed at one end of the machine it is evident that the pressure roller will act equally upon opposite ends of the roll of paper which would not be the case were the pressure roller independently movable at opposite ends. This arrangement of gears and rack bar also greatly facilitates the raising of the pressure roller out of engagement with the paper when it is desired to remove the latter from the machine or adjust it in any way. The shaft 21 is preferably provided with a hand wheel 24 by the rotation of which the pressure roller may be readily raised.

As previously stated, one important feature of my invention resides in the means employed whereby a pressure roller of comparatively small mass may exert a heavy pressure upon the paper. To accomplish this I provide the shaft at one end with a friction drum 25 and pivotally mount two brake shoes 26 upon the frame. These brake shoes may have any suitable form of friction surface such for instance as inserts 27, and each is curved so as to engage with approximately one-half of the periphery of the drum 25. A suitable screw 28 may be employed for drawing together the free ends of the brake shoes so as to grip the drum there-between

and thus apply any desired degree of resistance to the rotation of the shaft 21. As the roll of paper increases in size it is necessary for the pressure roller 13 to move vertically and this vertical movement necessitates a rotation of the shaft 21. By applying a heavy resistance to the rotation of this shaft 21 I retard or resist the upward movement of the roller 13, so that the roller even though of light mass will act upon the roll of paper with a pressure determined by the amount of friction applied on the drum 25. By adjusting the clamping screw 28 the pressure may be controlled at will. When it is desired to remove the roll of paper from the machine the clamping screw 28 may be loosened to release the drum and the pressure roller readily raised by the hand wheel 24. The clamping screw may then be tightened to hold the pressure roller in its elevated position during the removal of the roll of paper. The drum and brake shoes thus operate not only to control the application of pressure to the paper being wound, but also serve as a means for holding the roller in elevated position when the machine is at rest.

In case it is desired to apply greater pressure to one end of the roll than to the other or in case the paper is slightly thinner along one edge than at the other I provide means for slightly raising or lowering one end of the pressure roll in respect to the friction supporting rollers and thus insure the movement of the pressure roller in parallelism in the adjusted position during the winding operation. One means which may be employed to accomplish this result is illustrated in detail in Figs. 3 and 5. In this embodiment of my invention one of the gears 23 is loose on the shaft and is formed either integral or rigid with a short sleeve 29 which latter has an outwardly projecting arm or stud 30. This stud or arm lies adjacent to the surface of a disk which in the present embodiment is the hand wheel 24, but of course it may be separate from this hand wheel. Upon this disk are two lugs 31 upon opposite sides of the arm and within each stud is a set screw 32 engaging with the stud. The disk or hand wheel is keyed to the shaft so that it can not rotate in respect thereto and the set screws normally hold the gear wheel against rotation in respect to the shaft. By loosening one set screw to a slight extent and tightening the other to a corresponding extent the gear wheel may be rotated a limited amount and as this rotation is independent of the rotation of the opposite gear it is evident that there will be a corresponding raising or lowering of one end of the pressure roller. After the pressure roller has been thus adjusted the gears will rotate simultaneously with the shaft and the pressure roller will be raised in parallelism during the winding of the paper. Other means may be employed for facilitating a slight angular adjustment of one gear wheel in respect to the shaft, but it is important that the adjusting mechanism be such that fine adjustment may be secured and the gear then held rigid in position and prevented from accidental loosening or slipping. In Fig. 6 I have shown two lugs 31a corresponding to the two lugs 31 previously referred to and in this form I employ only a single screw 32a, which may be held from longitudinal movement in respect to the lugs but have its intermediate portion constituting a worm gear meshing with teeth upon the free end of the stud or arm 30a. It is evident that a rotation of this worm will swing the arm, but the tendency of the arm to swing will not cause a corresponding rotation of the worm.

Various other changes may be made in the construction and arrangement of parts without departing from the spirit of my invention.

PROCESS OF MAKING BISULPHITE OF SODA.

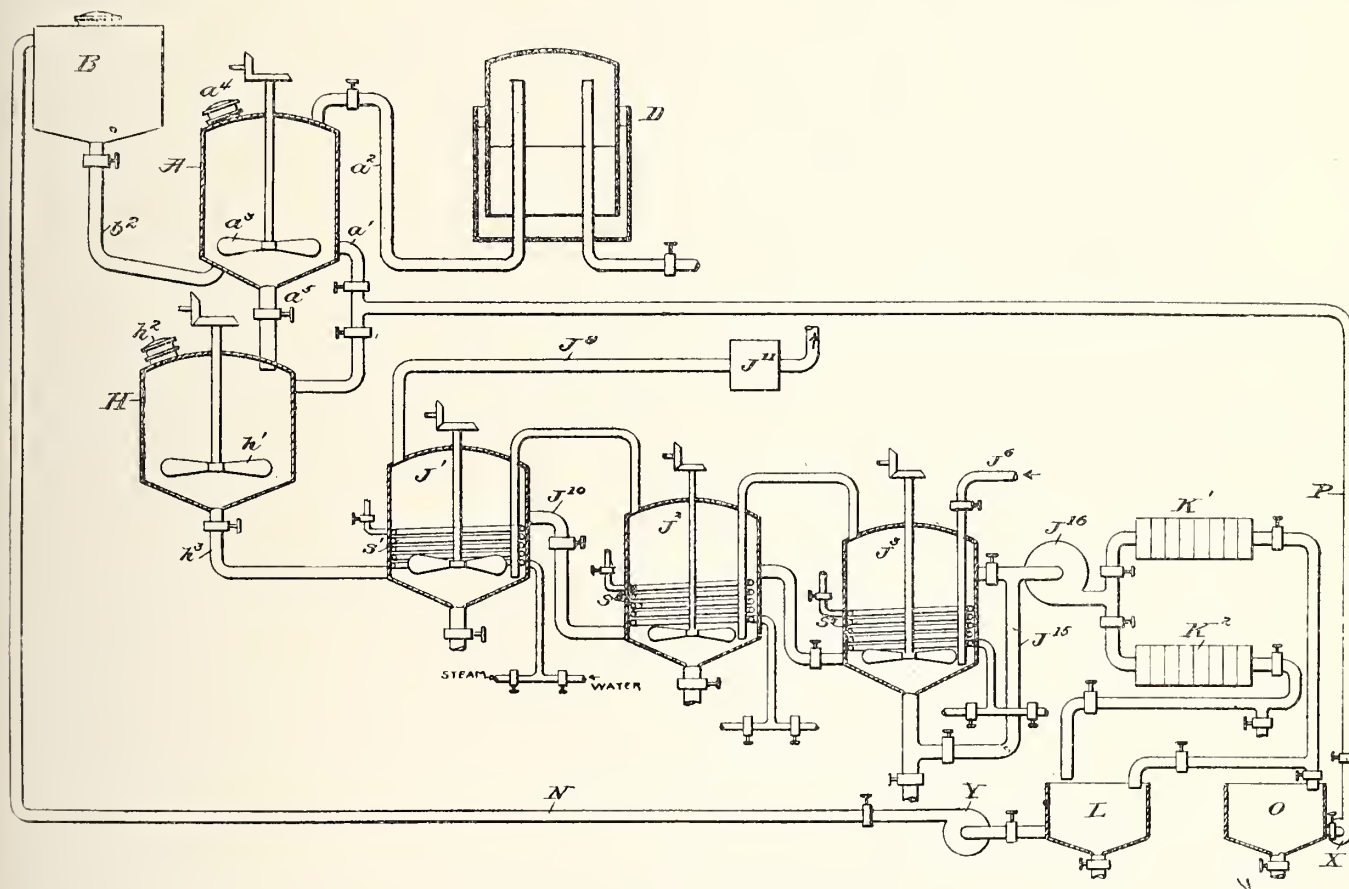
HENRY HOWARD, Boston, Mass., Patentee—Patented July 28, 1914, in United States Patent Office.

This invention relates to a process for making bisulphite of soda from sulphur dioxide, ordinary salt cake, or a sulphate of soda, and either calcium hydroxid or calcium carbonate. The precipitated calcium carbonate known as "lime mud," a by-product in the manufacture of caustic soda from carbonate of soda, is a useful material in this process and also gives off carbon dioxide which is collected.

In the accompanying drawing, the process is represented diagrammatically.

When calcium carbonate, "lime mud," is used, a suitable quantity suspended in water is added to tank A through its manhole a^4 , and kept in suspension by the stirrer a^3 . Water may be added to this tank through pipe a^1 . Into the bottom of this agitated mix-

operation is added through pipe P^2 . The thoroughly mixed solutions of sodium sulphite and sodium sulphate with calcium sulphate in suspension are now run through the valved pipe h^3 into the first of a series of closed converting tanks of which three, J^1 , J^2 , J^3 , are shown in the drawing, each containing a coiled pipe S^1 , S^2 , S^3 through which steam or water may circulate to control the temperature of the solutions in the tanks. Each tank further contains a stirrer to keep the contents well stirred. The mixed solution of sulphite and sulphate of soda with calcium sulphite enters the bottom of the first tank J^1 from h^3 and runs out at the top of the first tank J^1 from h^3 and runs out at the upper part through pipe J^{10} , leaving a gas space above; from there it enters tank J^2 at the bottom, leaving at the upper part, and enters at the bottom of tank J^3 , leaving at the upper part, or through by-pass J^{15} to pump J^{16} , and then to the filter-presses K^1 - K^2 . A stream of sulphur dioxide, such as burner gas, passes through



ture is run a solution of sodium bisulphite, through pipe b^2 from tank B, from a prior operation or any other source, in such quantity that the calcium carbonate will be decomposed, forming calcium sulphite, sodium sulphite, and carbon dioxide, the latter passing out through pipe a^2 into tank D. The sodium bisulphite is run into the bottom of the calcium carbonate in order that the carbon dioxide collected may not be contaminated with sulphur dioxide, which would be the case if the sodium bisulphite was run into the top of the calcium carbonate or lime-mud. After this reaction is completed, the mixed calcium sulphite and sodium sulphite is run through the valved pipe a^5 into the sulphate tank H, wherein it is constantly stirred by the stirrer h^1 . To this solution is added sufficient salt cake, or sulphate of soda, through the manhole h^2 , to subsequently precipitate the calcium as sulphate of calcium, and water or wash-water from a subsequent

the converting tanks in the opposite direction, entering at the bottom of tank J^3 through the pipe J^6 , and from this tank J^2 and J^1 , from which it is pumped through the pipe J^9 by the pump J^{11} and passed into a suitable absorbing liquid, not shown wherein any traces of sulphur dioxide are absorbed; the excess of gas then passing out into the atmosphere. Within the converting tanks the temperature is preferably maintained between 45 deg. C. and 65 deg. C., suitable thermometers in each tank serving to aid in the temperature regulation. At temperatures above 65 deg. C., the mass tends to thicken, and is difficult to control, at other hand, below 30 deg. C., the reaction is very slow. 90 deg. C., it forms a stiff mortar-like mass; on the In these tanks the sulphuric acid combined with sodium in the salt cake and sodium sulphate reacts with the calcium sulphite to form calcium sulphate, sodium sulphite also being formed. The sodium sulphite com-

bines with the sulphur dioxide and water present to form sodium bisulphite, the mixed solutions being constantly stirred, as above noted; the several reactions are completed when the solutions leave tank J. The sodium bisulphite and calcium sulphate are now pumped into the filter-presses K¹, K², one being used while the other is being cleaned; when passing through filter K¹, the outlet valves are so arranged that the finished liquor, sodium bisulphite, runs into storage tank L; as soon as the filter is filled with the precipitate of calcium sulphate, the valves are changed, the mixed solution of sodium bisulphite and sulphate of calcium is passed into filter K², and its finished solution, sodium bisulphite, passes into the storage tank. Filter K¹ is now washed and cleaned, the wash-water run into tank O, from which it may be pumped by pump X into the sulphate tank H through pipe P, or into tank A, when desired. A portion of the bisulphite solution in tank L is pumped by pump Y through pipe N into the tank B for a subsequent operation as above noted.

With the above method, the carbon dioxide in the "lime-mud" or other carbonate is recovered; if, however, its recovery is not desired, the lime-mud or other carbonate is mixed with its molecular equivalent of salt cake or sodium sulphate and water, in tank H; the mass is now run into the converting tanks J¹, J², J³ and treated with burner gas, care being taken to maintain the temperature between 45 deg. C. and 65 deg. C., as above described. The reaction between the lime-mud, sodium sulphate and sulphur dioxide forms calcium sulphate, sodium sulphite, and carbon dioxide, the latter passing into the atmosphere through pipe J³. The sodium sulphite combines with more sulphur dioxide forming sodium bisulphite, and the mass of bisulphite and calcium sulphate is now pumped into the filter presses, as described.

When calcium hydroxide is used, it is run direct into tank H, water being present to keep the hydroxide suspended, and stirred; the molecular equivalent of salt cake, or sodium sulphate is added thereto so that all the calcium hydroxide and sulphuric acid will combine to form calcium sulphate and water. The thoroughly mixed and agitated mass is then run into the series of converting tanks; from now on the process is the same as with the lime-mud, except that the temperature-limits may be greater. Other alkaline bisulphites may also be made by this process.

ABITIBI PROGRESSES.

The excavation for the new sulphite mill and the new news print mill of the Abitibi Power and Paper Co. at Iroquois Falls, Ont., has been completed, and the work on the foundation of the news print mill is going ahead rapidly. The company is busy shipping out ground wood pulp from eight to ten cars being sent out every day.

In the raising of over half a million dollars for the Toronto and York County Patriotic Fund, there were many generous contributions from paper houses, publishers, printers and others. The Provincial Paper Mills Co. donated one thousand dollars, Brown Bros., Limited, one thousand; Warwick Bros. and Rutter, one thousand, Copp, Clark Co., one thousand; W. J. Gage Co., one thousand; Southam Press, five hundred; Publishers Association of Canada, three hundred; Miller and Richard, two hundred and fifty; W. P. Ryrie (Becker Co. of America) two hundred, and others; W. P. Gundy of the W. J. Gage Co., was one of the most active workers on the organization.

SPANISH RIVER BUSY.

John G. Sutherland, sales manager of the Spanish River Pulp and Paper Co., who now makes his headquarters in Dayton, Ohio, is spending a few days in Toronto. Mr. Sutherland travels all over the continent, and there is no one more conversant with the news situation at the present time. He stated: "We are now making at the Soo, Espanola and Sturgeon Falls about four hundred and thirty-five tons per day and are running to the utmost capacity. We have withdrawn all quotations, and are not making any. Any business placed is on an individual arrangement. We are not taking on any new business at present and are looking after our customers, protecting them in every way. We have no ground wood or sulphite pulp for sale as we use all that we produce. I think there will be a shortage of news print in America about the first of the year, as about seventy-five per cent of the contracts now in force between newspaper publishers and the mills expire between now and the first of March next. Our company is doing no export business at all, although we have received inquiries from all parts of the world. The news mills should have three or four good years if they do not increase prices unduly, and safeguard their customers. I may say that our water conditions, since the recent rains, are first class, and we are going to send a large number of men to the woods to get out pulp wood. We have started already, and the number will be increased during the next few months. Operations with us will be on as large a scale as in other years.

Mr. Sutherland, who has been over the whole Western States, says that all paper mills are busy and that many, who were making wrapping and manila products have turned their machines onto news in order to help out in the demand. T. H. Watson, who is now President of the Canada Machinery Corporation with headquarters at Galt, Ont., recently resigned his position as Vice-President and Director of the Spanish River Co. and has been succeeded as a director by Percy Wilson of Sault Ste. Marie. The company has now only one vice-president, George H. Meade, who resides in Dayton, Ohio. W. N. Hurlburt, formerly of the Toronto office of the company, which was closed some months ago, and removed to Sault Ste. Marie, has been made assistant to C. H. L. Jones, who is manager of the operating departments and assistant to W. E. Stavert, of Sault Ste. Marie, President of the company.

TO OPEN UP NEW PULP DISTRICTS.

Preparations have been completed by the Quebec Government to open new districts to the lumber and pulp industries. During August and September, limits in the Abitibi and Lake St. John districts will be auctioned off. In the Lake St. John region the territory to be opened is north of the lake and in the basin of the Mistassini and Rat Rivers. In the Abitibi district it is situated south of the Transcontinental, but on the north slope in the basin which empties into James' Bay. This tract is traversed by the Poisson Blanc, Harriana and Bella Rivers. Both limits have been carefully surveyed by the forestry service.

Advertisements are gradually re-appearing in the London papers. Manufacturers perceive that whatever the length of the war, the normal demands of society must go on to an extent which will warrant active working up of business. The newspapers are increasing their size.

REVIVAL OF THE UNITED STATES CHINA-CLAY INDUSTRY.

The development of the china-clay industry in the United States, says Mr. Consul-General Wilfred Powell, is expected to progress more rapidly as a result of the advance in price of British clay. Before the Wilson Bill passed 18 years ago, put china-clay on the free list, the duty was about £1 a ton. At that time American clay was by no means in strong demand among the potters, who found fault with the careless washing and preparation, but producers were improving their process; and when duty-free clay was passed it put them practically out of business with the exception of one field known as the Brandywine Summit in the State of Delaware. The Payne-Aldrich Bill placed a duty on china-clay of 5s per ton, and quarrying of clay again took on an industrial aspect. There were brought from the United Kingdom in 1913 278,276 tons of white china-clay at an invoice value of about £325,821. Under the Underwood tariff china-clay will come in free again, and already the British producers have advanced the price. It may be recalled that when the Wilson Bill passed in 1895, and put clay on the free list, the price in Europe went up about 8s a ton.

At present foreign china-clay laid down in Trenton, the principal centre of pottery works in the States, cost about £2 12s 1d a ton. American clay, it is stated, can be delivered at a lower cost, and as producers are conforming to the proper idea of washing and preparation it is predicted that the producing of white china-clay is likely to become an industry of some magnitude.

This concession will call for the development of the water powers in the districts, and will carry the obligation to construct pulp mills of a specified capacity within three years.

The new plant of the Beaver Board Companies at Thorold, Ont., is about completed and, it is understood, that the mill will be running in the near future.

FEED-WATER DIFFICULTIES AND THE VALUE OF THE CHEMIST.

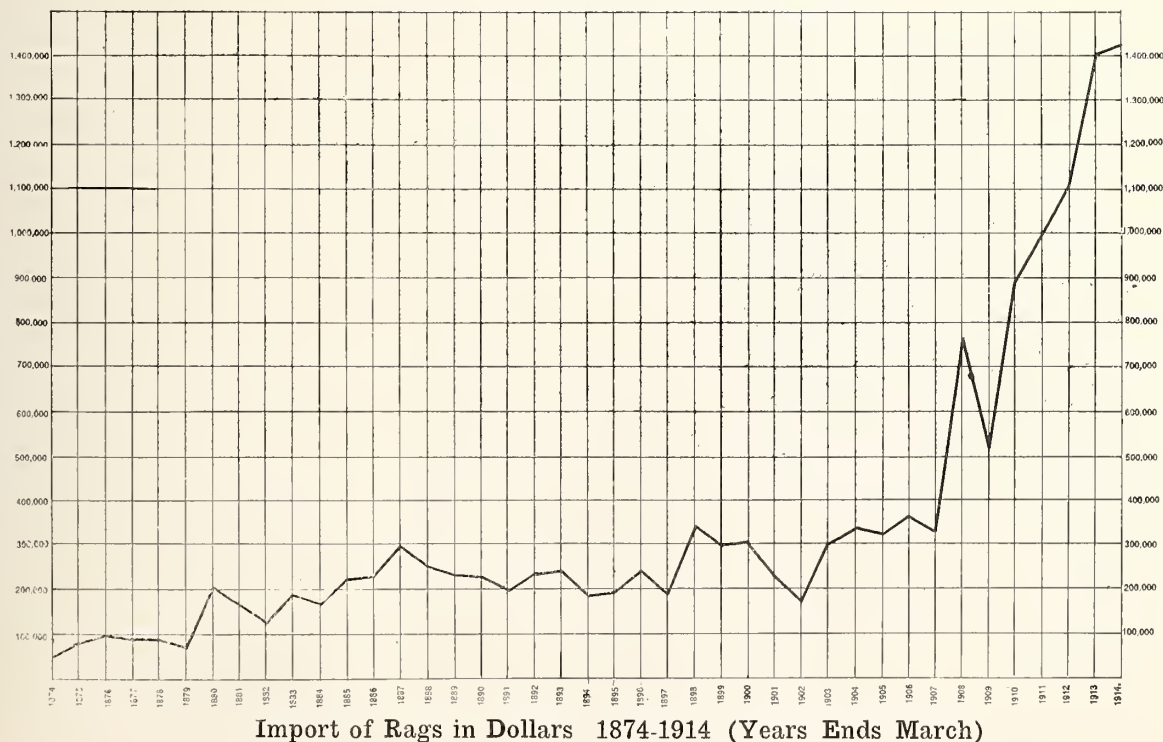
The problem of suitable feed-water is still a trouble-maker in many plants. The formation of scale and the softening of water are due to the simplest of chemical reactions, and by an analysis of the water a competent chemist can readily predict in advance the proper amounts of suitable chemicals necessary to prevent scale or corrosion, and not only save the company the expense of frequent boring and replacing of tubes, but obviate the necessity of attempting to force heat through the same substance with which many of your steam lines are insulated. The services of a chemist, said Mr. Carl F. Woods, secretary of the firm of Arthur D. Little, Inc., of Boston, when recently speaking before a group of street railway operators, would prevent the purchase of a special compound at \$1,000 a year, which consisted of 97 per cent water and 3 per cent molasses, or obviate the necessity of purchasing a mixture of soda ash, tanning, and water under a brand name at 8s a pound, when the principal ingredient can be obtained for 1s a pound.

MANUFACTURE OF LEATHER BOARD

Most leather boards are understood to have a relatively small proportion of leather (for instance, 15 to 20 per cent) in their composition. The balance is composed of brown pulp and old paper of good quality. In some mills, instead of placing the leather cuttings in clean water, they are immersed directly in the vats with milk of lime, where they are left as long as two months, according to the quality desired. This class of board is often made on ordinary rolling machines.

In order to produce a board resembling leather and fit to use in soles, it should be passed several times through the sheeting machine. Frequently, however, a thin sheet of real leather is pasted on a sheet of leather board. Most leather board sold does not contain any leather—fish-glue, gelatine, wax or other substances being added to give compactness and wearing qualities.

CANADA'S PULP AND PAPER TRADE



PULP AND PAPER NEWS

The George Irish Paper Co., of Buffalo, N.Y., have opened out in Toronto under the name of the Monarch Paper Co. The representative of the company is E. A. Crippen with office at 118 Sun Life Building. It is expected that stock will be carried in Toronto in the near future. The Monarch Paper Co. have been considering establishing branches in several other Canadian cities but are not likely to do so just at present owing to disturbed business conditions occasioned by the war.

C. DeWolf Reed, Montreal representative of the Provincial Paper Mills, Limited, spent a few days in Toronto last week and paid a visit to the mills of the company at Thorold, Georgetown and Mille Roches.

Mr. Featherstonhangh, formerly with McFarlane, Son and Hodgson, Montreal, has joined the selling staff of J. C. Wilson, Limited, Montreal. J. R. McGregor, late sales manager of the firm, who recently resigned, is going into the jobbing business in Montreal in his own behalf.

Alex. Cowan and Sons, Limited, paper makers of Edinburgh, like many other British firms which have done a large business in the paper line in the Dominion, have sent out notices to their Canadian customers that, in view of the present situation in Europe, then can only accept orders conditionally both as regards price and delivery. It is possible, the firm adds, that they may be totally unable to execute them or they may have to intimate an advance in price, and that it is impossible to say more at the present time on the outlook.

Austin Press, Limited, with a share capital of \$40,000 and head offices in Toronto, has been granted a charter. They are empowered to engage in the business of printing and publishing and engraving as well as to carry on the business of making wall paper, paper boxes, paper bags, etc.

It is said that pulpwood operations in the woods will be larger this year than for many seasons past especially in connection with the cutting of spruce, which is required to make up the depleted spruce reserve occasioned by the exceptional demand for news print and ground wood owing to the war.

Arnold and Bell, Limited, with a capital of \$100,000 and headquarters in Sudbury, Ont., have been granted a charter. Wm. J. Bell and John Parker Reid, lumbermen of Sudbury, are behind the enterprise, and the new concern is empowered to manufacture lumber and woodenware, sell and deal in timber limits, logs and water powers, as well as to manufacture and sell pulp and paper.

The Parry Sound Barrel and Manufacturing Co., Limited, of Parry Sound, Ont., are one of the recent large corporations granted a charter. The capital stock of the company is \$500,000, and they will manufacture boxes, cases and crates of all kinds and wooden ware fibre products such as toothpicks, clothes pins, etc. The incorporators are Charles L. Sanford, Wm. A. Leyda, and John P. McKelvie, of Toronto, John A. Johnson and T. C. Algar, all of Parry Sound.

It is hard to get bonds in war time as the financial conditions are affecting guarantee companies. This fact was brought out before Chief Justice Falconbridge at Osgoode Hall, Toronto, last week, when an injunction restraining the Russell Timber Co. from rafting 4,900 cords of pulp wood across Lake Superior from Black Sturgeon River to Ashland, Wis., was dissolved, upon the timber company giving a bond of \$12,000. Walter Hall Russell of the company made an affidavit telling how the war had made it difficult to secure a guarantee bond. There would have been no trouble prior to the present outbreak to get over with any of the companies. Though this company showed a surplus of \$98,000 last July, all the guarantee companies had refused to grant a bond unless cash or cash securities were put up to cover the amount. G. T. Clarkson, of Toronto, as assignee of the Northern Islands Pulp Woods Co., made a claim against the wood in question.

The Garden City Paper Mills, of St. Catharines, and the Interlake Tissue Mills, of Merriton, Ont., are both making creditable exhibits at the Canadian National Exhibition in Toronto, having nicely fitted up booths in the Manufacturers' Annex in which many lines of toilet and tissue papers are displayed and also the numerous specialties which are turned out. The showing made by both companies is a tribute to the enterprise of these industries.

Samuel Price, K.C., chairman of the Workmen's Compensation Commission for Ontario, states that the organization of the new department is assuming definite shape. The necessary forms are being drafted and out to manufacturers and all other employes of labor requiring information as to the number of men employed, duration of employment, pay roll and such other data as is necessary, to enable the board to adjust the schedules and determine the assessment that each industry or group of industries shall bear. When this information is all received, it will be collected and available for reference and then the rate will be struck in accordance with the industrial hazard of the various occupations. It is not likely that the new law will be in operation before the beginning of next year.

On the occasion of his departure for Valcartier, the members of the Toronto Ad Club presented their Secretary-Treasurer, Lieut. A. J. D. Davidson, with a handsome wrist watch. He will be appointed Quarter-Master of the Second Corps of the Canadian Engineers.

A scheme has been submitted to the Ontario Government, and the Hon. W. H. Hearst, Minister of Lands Forests and Mines, will make a report upon it, which will give work to the unemployed and at the same time develop the country. It is to the effect that the Ontario Government open up alternate quarter sections in Northern Ontario and that the land could be cleared during the winter months of pulp wood. The country would in this way be improved, and the land appreciated in value. The work could be done without costing the government a cent. By next summer much of the soil would be ready to grow crops.



The Markets

CANADIAN MARKETS.

The market situation, owing to the war, remains uncertain so far as prices on the general lines of paper and pulp are concerned. In newsprint, which is in abnormal demand, both from a domestic and foreign standpoint, there are no fixed quotations, particularly for export business. The circulation of some Canadian papers, since the outbreak of hostilities, has increased fully fifty per cent., and the demand for newsprint, since the first of August, has gone up from twenty-five to forty per cent. All plants are running to capacity, and machines are being speeded to the utmost. Of course, all Canadian mills will take care of their contract customers first, before catering to the numerous outside firms which are asking for quotations by letter, telegraph, and cable from almost every country in the world.

It is understood that some of the large exporting mills have secured orders for as high a figure as two and a half cents f.o.b. mill. This is exceptional, and applies to war prices and instant delivery. A leading authority stated this week that he would not be surprised, if the interest and uncertainty of the war kept up, to see newsprint, on foreign shipments, at least, touch three cents. Orders are now being shipped to England, South Africa and South America, as well as much larger quantities to the United States. Practically all quotations have been withdrawn, and the price will be regulated by demand and supply. Every plant is working to one hundred per cent. efficiency, and when domestic contracts are renewed at the end of the year, publishers will have to pay higher.

In sympathy with the call for greater quantities of newsprint, the price of ground wood is stiffening, and one Canadian mill reports that it was asked twenty-five dollars per ton for fifty tons of No. 1. This is a record mark, although shipments are being made to the United States at this figure. Book and writing, coated paper and tissue plants have, in the majority of instances, withdrawn all figures. In tissue papers there has been an advance of about five per cent. but on book and writing, bond, ledger and linen, the same figures hold, only the mills want to be in a position to raise if they have to pay too high for their material, for sulphite pulp has taken a big jump. Then there may be all sorts of difficulty in getting foreign rags, dyes, chemicals and as well as casein, china clay, satin finish, etc., from abroad. The market locally has been scoured and in some instances dyes have gone up one hundred per cent. and over.

Book and writing mills do not wish to take advantage of customers, and, for that reason, to safeguard their own interest, have adopted the precaution of withdrawing prices. If there is an advance in raw materials they will have to augment prices sympathetically to the extent which they are called upon to expend. There are about nine million dollars in English book, coated, ledger, art, surface finish and other foreign papers coming into Canada each year, while local production is only about two-thirds of this amount. English and Scotch mills have advised the trade in the Dominion that they will only accept orders conditionally, both as regards price and delivery.

Representatives selling German papers are closing out their stocks locally. Manilas, paper bags, and kraft is strengthening in price.

As for ground wood, that market, which has been dull for nearly a year past, has taken on new life, owing to the shutting off of foreign supplies. The same may be said of sulphite, which has gone up in some cases as much as ten dollars per ton for No. 1 unbleached. Only small lots are open. Customers, who have contracts, will be fully taken care of. One Canadian mill received inquiries within one week for twenty thousand tons from American consumers. About twenty-five thousand tons have been received monthly by American mills from abroad, and there will be no competition now from Germany, Austria, Sweden or Norway. Just what the effect will be, as soon as the supplies, which are on the docks at Atlantic ports, are exhausted, cannot be told at the present writing. The condition of affairs may be very grave. Canada has been shipping to the United States about six or seven thousand tons of sulphite per month, and cannot increase this very much.

The situation will be largely determined within the next thirty days as to what altitude prices will touch. Water conditions in the Dominion, considering the heavy rains of late, continue very good for this season of the year. The situation in the rag and paper stock arena, reflects pretty much the same state of affairs as in pulp, and prices have been raised on many lines. Quotations on every thing in the pulp and paper line are now being made pretty much on individual orders, and in the matter of ground wood pulp, sulphite, etc., so far as Canada is concerned, ascending values will probably reach the highest point known in years. There is no disposition on the part of any mills to cancel any contracts which have been made, but on new ones, all will seek to secure the best arrangement possible. Mixed papers are scarce, and higher, while roofing stock is jumping in price.

Quotations, f.o.b. Toronto are—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in earload lots.
 News (sheet), \$2.05 to \$2.25 at mill, in earload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (earload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (earload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (earload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$3.75.
 Manila, B., \$2.90 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.10.
 Unglazed Kraft, \$3.50 to \$4.50.
 Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$17.
 Ground wood, \$22 to \$25 delivered.

Sulphite (unbleached), \$48 to \$50, delivered in Canada.
 Sulphite (unbleached), \$50 up, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 50c.
 White blanks, 80c to 82½c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 40c to 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 39c. to 35c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.35 to \$1.40.
 No. 1 white shirt cuttings, \$5.25.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.00.
 Ordinary satinetts, 80c. to 82½c.
 Flock, 90c to 92½c.
 Tailor Rags, 70c.

Prices in Montreal remain about the same, the only difference being in the substitution of spot quotations instead of contracts.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.
 On large orders to the jobbing trade some manufac-

turers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

New York, August 25, 1914.

The opinion in the local market regarding the ground wood situation is that there has been too much neglect of its real phases. The loss of 10,000 tons by fire only a few weeks ago has already shown some influence on the market. Some grinders have attempted to take advantage of the present situation, and have offered their fresh pulp at a mill price of \$25. No paper mill would consider such a figure. Other fancy prices were mill figures ranging from \$21 to \$24. The real sales of ground wood were made at \$17.50 to \$18.50 f.o.b. mill. Good supplies have been moved at these prices.

The domestic sulphite situation is somewhat brighter. Manufacturers have decided that it is the best policy not to take advantage of the impossibility to get foreign pulp and have put a price of \$42.50 to \$45 f.o.b. mill on unbleached sulphite. Some quotations such as \$50 and \$60 f.o.b. mill, even made by manufacturers of sulphite, who found no market for their goods at that price. There was almost a state of wildness in the foreign pulp market during the first week, after the war began. Fancy prices were quoted among many importers. Then it became evident that there was really very little to the talk that passed from month to month regarding prices. The truth is that importers did not sell except to regular customers and then no advantage was taken. Importers have tried to make a pro rata division of the small supplies they have on dock, amongst their contract customers. There are no prices.

The foreign rags and bagging situation is the same as the pulp market. No quotations are made, and what supplies are available are being fairly divided amongst regular customers. Mills are less inclined to reject materials now, and in fact have accepted without protest, goods that they have rejected after paying all freight rates.

Domestic rags are scarce, and prices in all grades have gone up under a fair demand, from 1½c to 1c a pound. There is a great deal of talk among packers about what prices they will move stuff. Most of this seems to be imaginary activity, for the dealers in general are moving stock wherever there is a profit. Packers have, in some cases taken advantage of the present situation and have failed to deliver goods ordered by some dealers. On investigation the dealers learned that the goods were shipped by the packer at the order of someone else who offered about \$2.00 a ton more for the goods.

Most old waste papers have been rather plentiful. Since the checking of pulp shipments, paper manufacturers have been looking for substitutes. Kraft and Manilla papers have, therefore, been in good demand at \$1.00 to \$1.25 a hundred and mixed old manillas sold at \$2.60 a hundred and flat stock advanced from the same grade sold for 40 cents. Hard shavings sold at 2.60 a hundred and flat stock advanced from

\$2 to \$4 a ton over previous quotations. There are plenty of old newspapers on hand on account of the heavy editions of newspapers in this city. Prices, despite this have advanced about a dollar a ton for all grades of old news. Mixed papers sold at 42½ to 45 cents a hundred.

Pulp.

(Quotations on all European pulps have been withdrawn and available supplies are commanding very high levels. The following ranges are purely nominal and cannot be taken as a criterion of the market.)

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$17.50 to \$20, delivered.

Unbleached Sulphite, dom., 2½ to 2¼ f.o.b. mill.

Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.

Bleached Sulphite, domestic, 2.80 to 3.00.

Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.

Easy Bleaching, impt., 2.75, ex dock, New York.

Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.

Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.

Kraft Pulp, 2.25 to 2.35, ex. dock, New York.

Paper.

The demand for all grades of paper has advanced to some extent. Prices in all grades have been withdrawn, but the quotations given below give an idea of the price at which paper has been sold in New York. Jobbers have had only small stocks, and are now making a stiff effort to cover their shelves before prices go any higher. Newsprint has moved rapidly on contract and sheet news has advanced from 2.15 to 2.35 f.o.b. New York. Newspapers have cut down the number of pages and have kept the consumptive increases at a minimum. With the large tonnage that was on hand at the turn of the year, there has really been little extra demand on newsprint mills. The feeling is that renewal prices will probably be a little higher than at present. Side runs are very scarce. Manufacturers have not been running their machines any wider than is necessary to make the rolls for contract movement, and thus side runs have not accumulated. Offers of 2.20c a pound, f.o.b. New York, were made this week. Kraft papers have advanced a quarter of a cent a pound and are in good demand. Tissues are none too plentiful and prices are soaring. 45c to 50c a ream for a No. 1 white is not rare. Manilla tissues reached the 50c mark and are likely to go still higher. The demand for pattern tissues has been very heavy and its price has gone up. Boxboards have been in fair demand, and are now being sold at the prevailing price of a few months ago. Prices on writings, bonds and ledgers have been withdrawn.

These quotations are purely nominal. All mills have withdrawn prices and quote only on orders for a 30-days' supply:

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.

News, rolls, contract renewals, \$2.05, f.o.b.

News, side runs, 2.20.

News, sheets, 2.35 f.o.b. New York.

Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.

Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.

Writing paper, extra fine, 11c del. east of the Miss. River.

Writing paper, No. 1, fine, 9c, del. east of the Miss. River.

Writing paper, No. 2, fine, 8c del. east of the Miss. River.

Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.

Bond paper, 5c to 24c, delivered east of Mississippi River.

Ledger paper, 8c to 30c, delivered east of Mississippi River.

Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 5c to 5¼c, delivered.

Manila, wood, 2.65 to 3.25, delivered.

Kraft, No. 1, \$3.85 to \$4.00 f.o.b. New York.

Kraft, No. 2, \$3.25 to \$3.35 f.o.b. New York.

Boxboards, news, \$30 per ton, delivered.

Boxboards, straw, \$28 per ton, delivered.

Wood pulp board, \$42.50 per ton, delivered.

Tissue, white, cylinder, 45c to 47½c f.o.b. New York.

Tissue, fourdrinier, 50c f.o.b. New York.

Tissue, jute Manila, 45c to 50c, f.o.b. New York.

NOT PESSIMISTIC, ANYWAY.

Leaders in the writing and bond manufactures, while regarding the present situation as intensely problematical, are not disposed to be downhearted over the outlook. There is every probability of a strong revival to Canadian-made goods, and whatever the demand, prices should be good.

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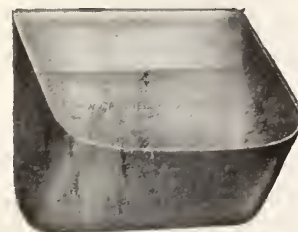
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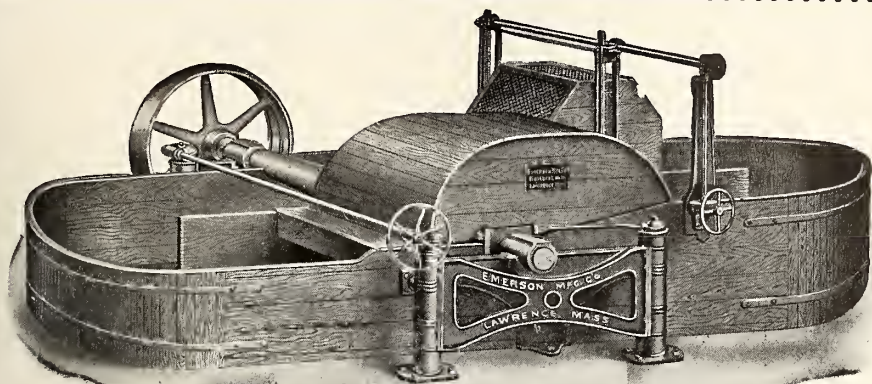
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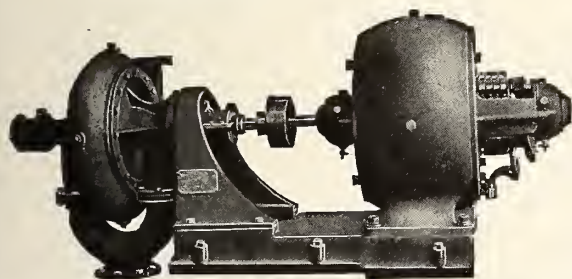
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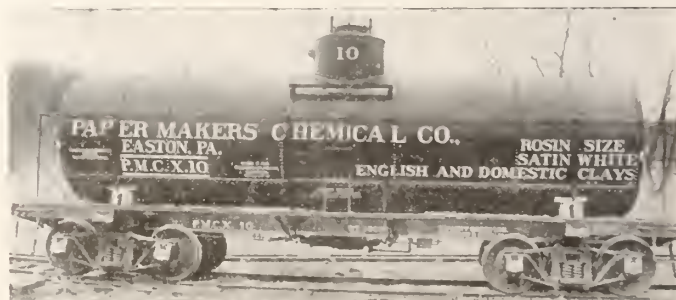
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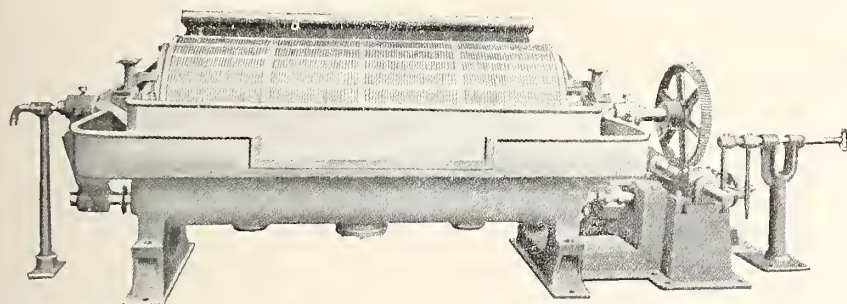
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- Air Compressors**
Blethen, Hugh R., New York
- Air Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkers**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
- Belting**
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
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Dominion Belting Co., Hamilton, Can.
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Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
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Sherbrooke Mach. Co., Sherbrooke, Que.
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MacDougall, J., Caedonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Foulardier Wires**
Capital Wire Cloth and Mfg. Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calendar Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticizing Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chip Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
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Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg. Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
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Kufferath, Andreas, Mariaweller, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
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Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
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- Digester Lining**
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Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
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- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Engineers Ltd., Montreal, Can.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Felts**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, Manchester, Eng.
Spencer, J. R. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

Trolleys

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Hoists

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont

Hoists—Chain Electric and Pneumatic

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines

Boving & Co., of Canada, Limited, Toronto, Ont
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.

Knives

Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.

Kollergangs

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines

Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.

Motor

Chambers Ltd., 152 Bay Street, Toronto.

Presses

Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.

Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.

Paper and Pulp Machinery

Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co. London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachometers

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester

Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England

Pneumatic Thickeners

Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.

Pneumatic Chain Blocks

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls

Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbrooke Mach Co Ltd, Sherbrooke, Que.

Pulp Stones

Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England

Pumps

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass
Smart-Turner Machine Co., Hamilton, Can
Sherbrooke Mach Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Recording Gauges

Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y

Refiners

Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Marx, J. & Co., London, E.C., England.

Process Engineers, Ltd., Montreal, Canada.

Rice, Barton & Fales Mach. & Iron Co., Worcester, Mass.

Voith, J. M., New York, N.Y.

Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size

Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg, Montreal, Can.

Rosin Size Boilers and Dissolvers

Boving & Co., of Canada, Limited, Toronto, Ont
Process Engineers, Ltd., Montreal, Can.

Rotary Silver Screens

Jensen og Dahl, J. & A., 1 Broadway, New York City

Rotary Sulphur Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls

Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens

Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach Co. Ltd, Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs

Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont

Straw Cutters

Bertrams Ltd., Edinburgh, Scotland
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters

Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator

Pickles, W. F., Buckland, Conn.

Stuff Chests

Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch

Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.

Sulphite Engineering and Manufacturing Co., Watertown, N Y

Sulphate Mill Equipment

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.

Sulphur

Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Tachometers (Hand and Stationary)

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
 Canadian Allis Chalmers, Ltd., Toronto, Ont.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M. Co., Inc. New York, N.Y.
 Voith, J. M., Wurttemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis Chalmers, Ltd., Toronto, Ont.
 Hamilton, Wm. Co., Ltd., Peterboro, Can.
 Smith, S. Morgan Co., York, Pa.
 Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
 Christie, Geo., Ltd., Glasgow, Scotland.
 Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
 Tippet, Arthur P. & Co., Montreal, Can.

Taylor, J. A., Montreal, Can.
 United Wire Works, Ltd., Edinburgh, Scotland.
 Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm. Co., Peterboro, Can.
 Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Machinery Co., Sherbrooke, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Basin Electric Light & Power Co., Ltd., Montmagny, Que.
 Beaver Co. Ltd., Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
 Booth, J. R., Ottawa, Ont.
 Bronson Co., Ltd., Ottawa, Ont.
 Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
 Colonial Wood Products Co., Ltd., Thorold, Ont.
 Campbell Lumber Co., Weymouth, N.S.
 Canada Paper Co., Ltd., Montreal, Que.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Compagnie de Pulpe de Dalmas, Dalmas, Que.
 Davy, James, Thorold, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
 Ford, J. & Co., Port Neuf, Que.
 Jacques-Cartier Pulp & Paper Co., Montreal.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 La Havre Pulp Co., Ltd., Bridgewater, N.S.
 Lake Megantic Pulp Co., Lake Megantic, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 MacLaren Co., Ltd., The James, Buckingham, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
 North Shore Power, Railway & Navigation Co., Clarke City.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
 Ontario Paper Company, Thorold, Ont.
 Ouatchouan Falls Paper Co., Ouatchouan Falls, Que.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Price-Porritt Pulp & Paper Co., Rimouski, Que.
 Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
 River-du-Loup Pulp Co., Ltd., Fraserville, Que.
 Soucy, F. Florentine, Old Lake Road, Que.
 Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
 St. George Pulp and Paper Co., St. George, N.B.
 Thorold Pulp Co., Ltd., Thorold, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Union Bag & Paper Co., Cape Madeleine, Que.
 Trent Valley Paper Mills, Glenmillier, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
 Dryden Timber and Power Co., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Quebec and St. Maurice Industrial Co., La Tuque, Que.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
 Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Booth, J. R., Ottawa, Ont.
 Dominion Pulp Co., Ltd., Chatham, N.B.
 Donnacona Pulp & Paper Co., Donnacona, Que.
 Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
 Powell River Co., Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordan Pulp & Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
 Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
 Lincoln Paper Mills Co., Ltd., Merriton, Ont.
 Ford, J. & Co., Port Neuf.
 Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
 Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
 Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manila,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
 Eddy Co., The E. B., Ltd., Hull, Que.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Spe

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor
 Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co., Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art
 Cover," "Derby Cover," "Fibrestock Cover," "Cashmere
 Cover," "X Cover," "XX Cover,"
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

ibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec.
 Donnocona Pulp and Paper Co., Donnocona, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmillier, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B. Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal, Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," "Hercules Manila," "St. Francis Manila," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Crendon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co

Halifax, N.S.

Eastern Supply & Paper Co., 23 Bedford Row
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 6½ King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

WANTED—Pulpwood General Superintendent wanted for the supervision of a very large operation. Must have thorough experience and be a pulpwood specialist. Operation is a large one and requires good operator and good business man. State in full, experience, present position, age and other particulars in confidence. Apply, Cheap Pulpwood, care of Pulp and Paper Magazine, Montreal.

NIGHT FOREMAN wanted for Canadian pulp mill; state experience, references, full particulars. Reply to Box 88, Pulp and Paper Magazine, Montreal, Que.

BRITISH HOUSE.—Old established and of highest standing, with first-class references, want Agencies of good Pulp and Paper Mills. Cash advances and financial facilities granted. Box 89 Pulp and Paper Magazine, Montreal, Que.

A RELIABLE AMERICAN PAPER MANUFACTURER is desirous of purchasing fifty-thousand cords of pulpwood annually for a term of years. Wood to be delivered by boat on River St. Lawrence. Correspondence solicited. Address "American Manufacturer, care of Pulp and Paper Magazine, Montreal, Que.

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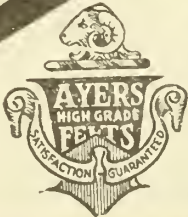
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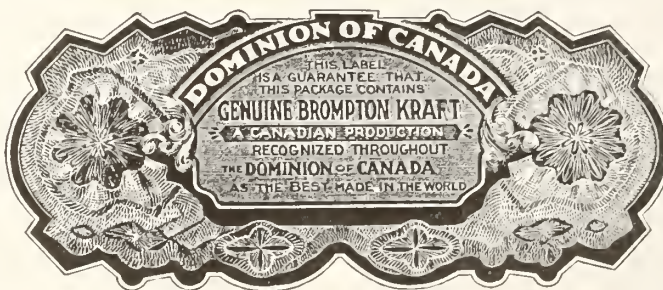
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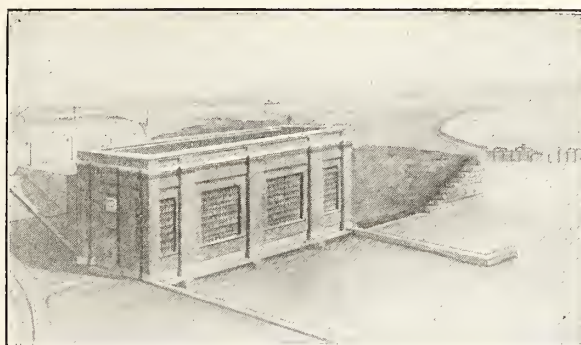
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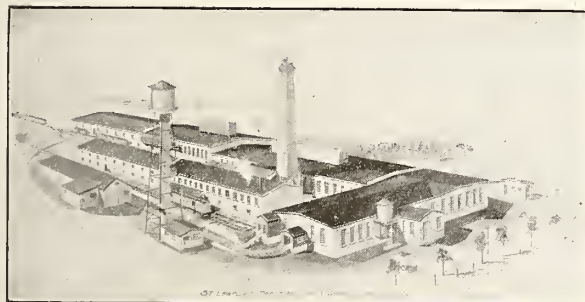
Barber Paper Mill, Georgetown, Ont.



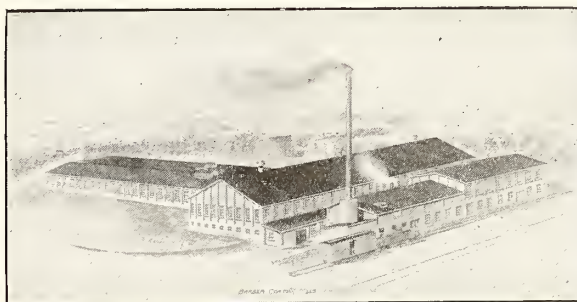
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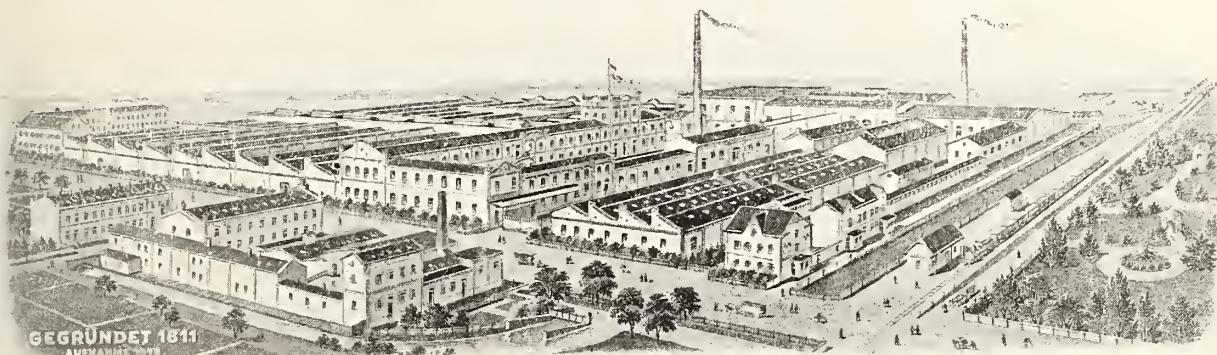
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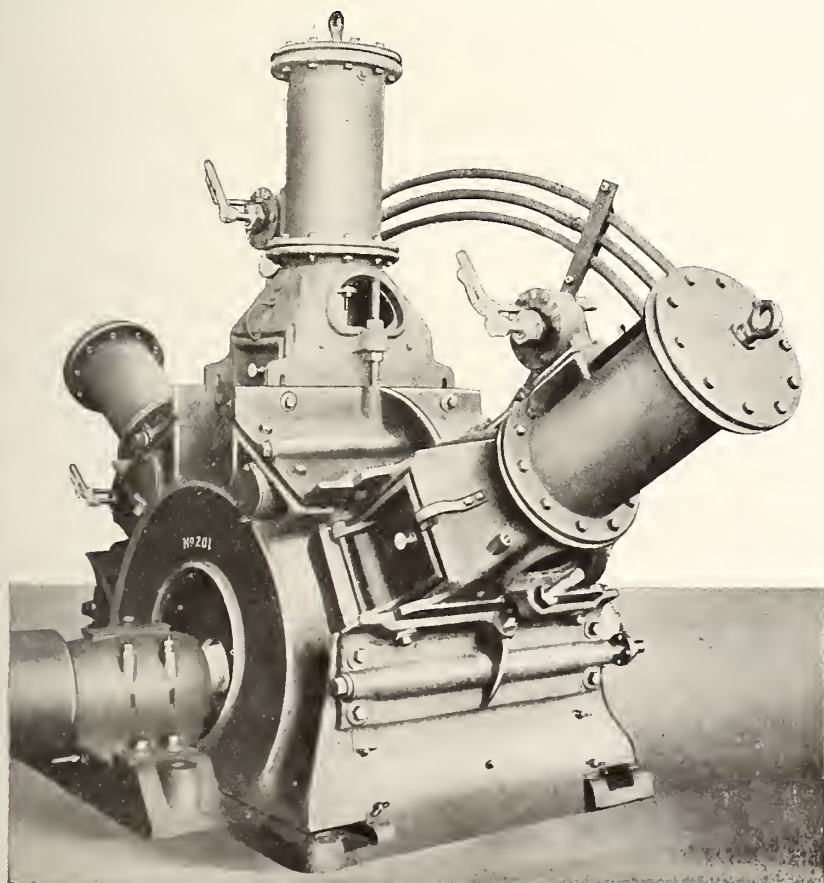
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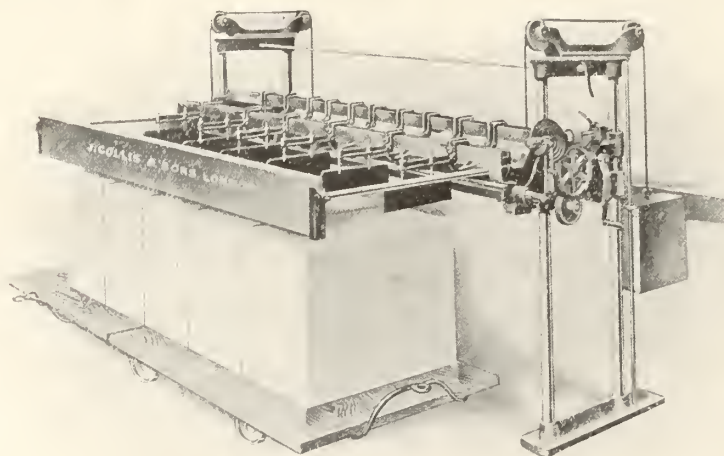
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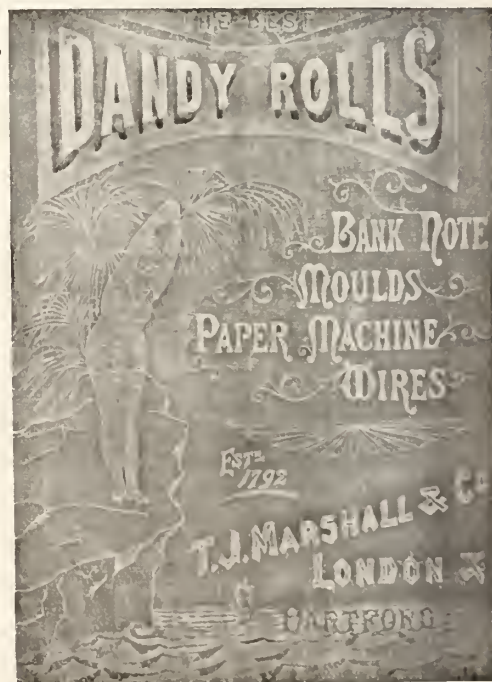
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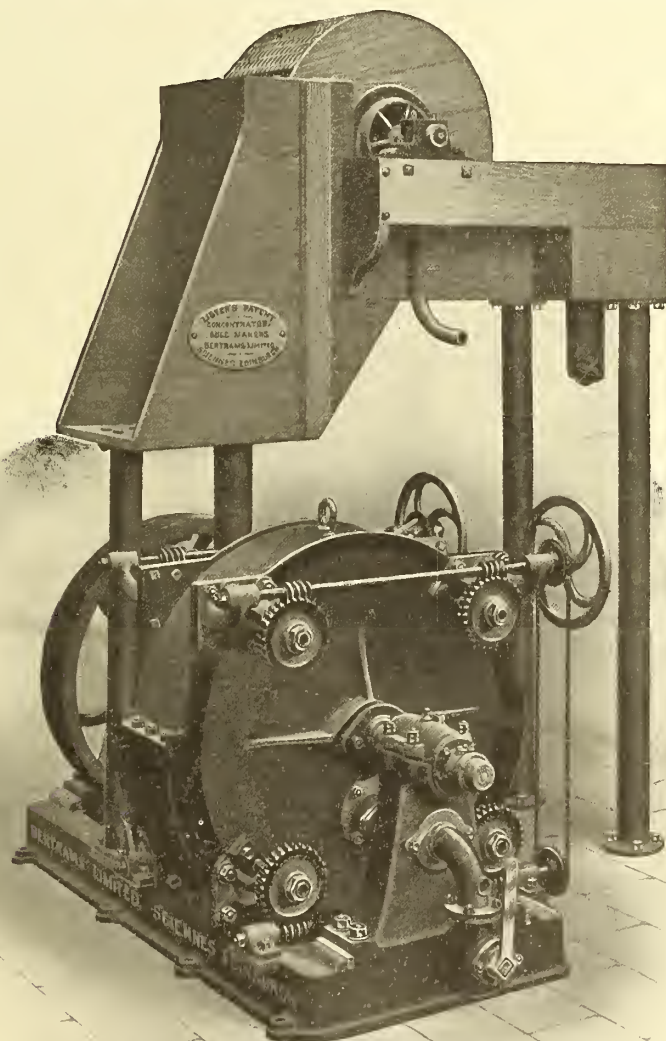
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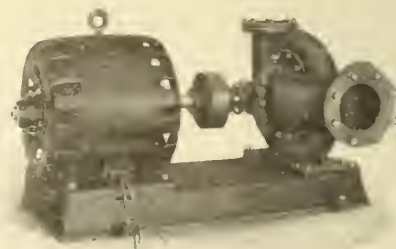
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See Bulletin 510



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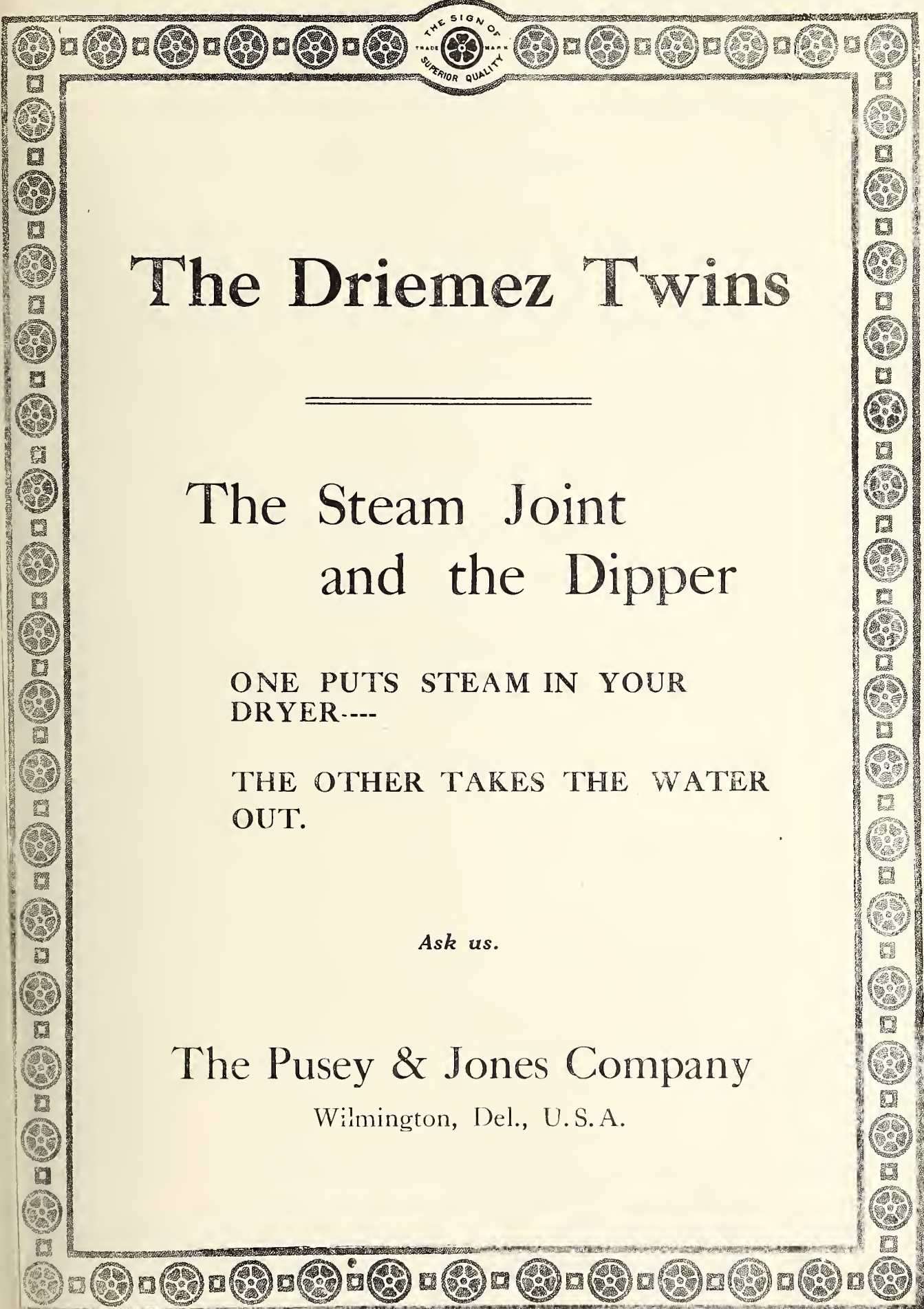
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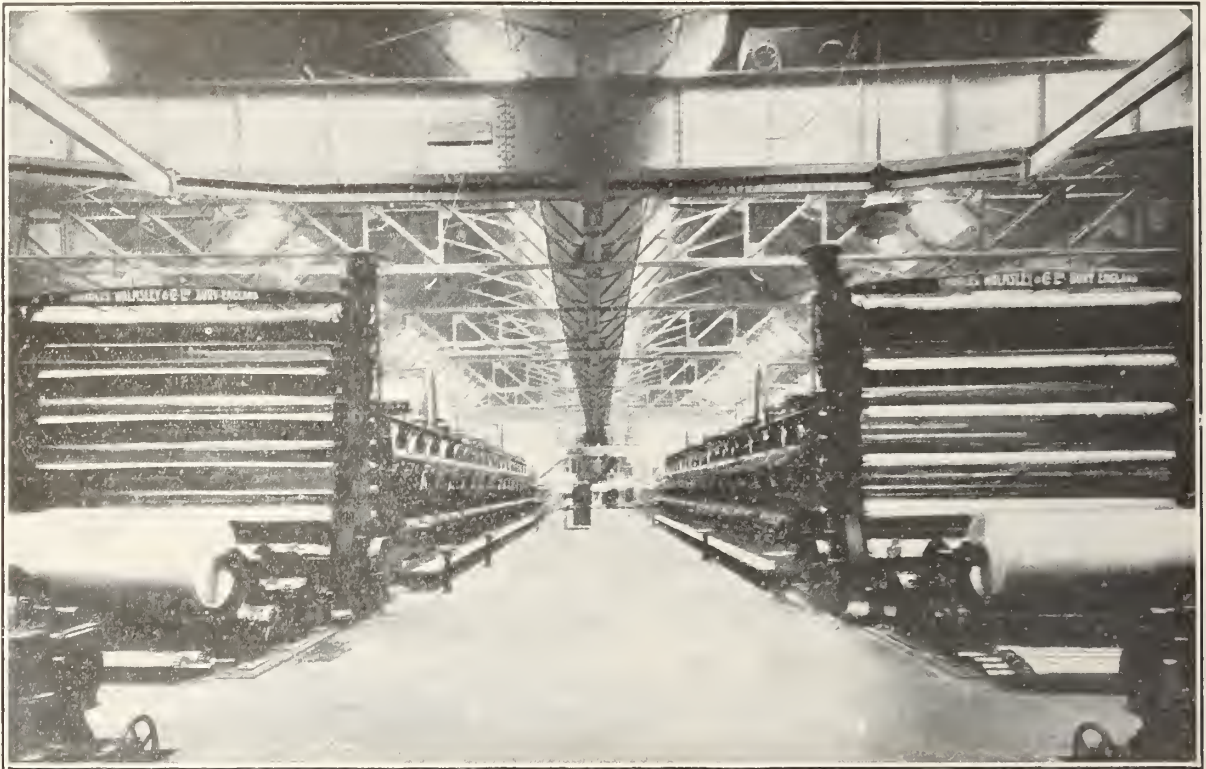
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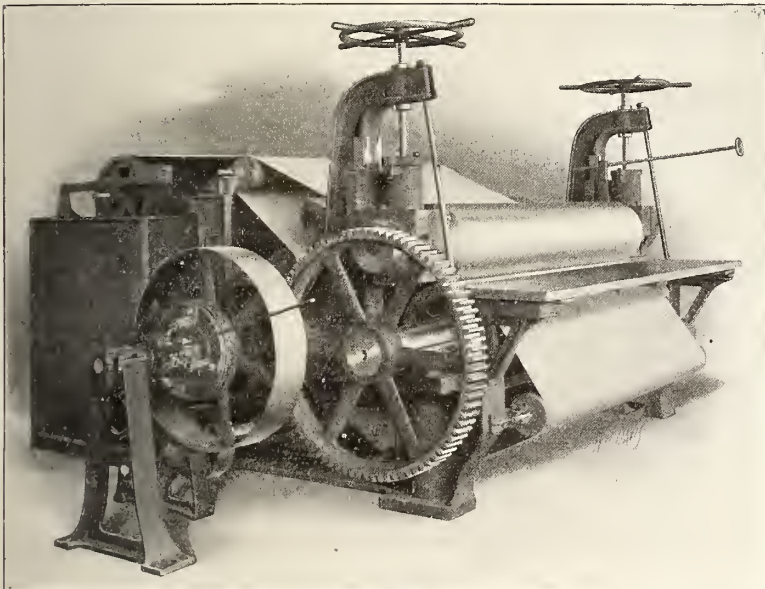
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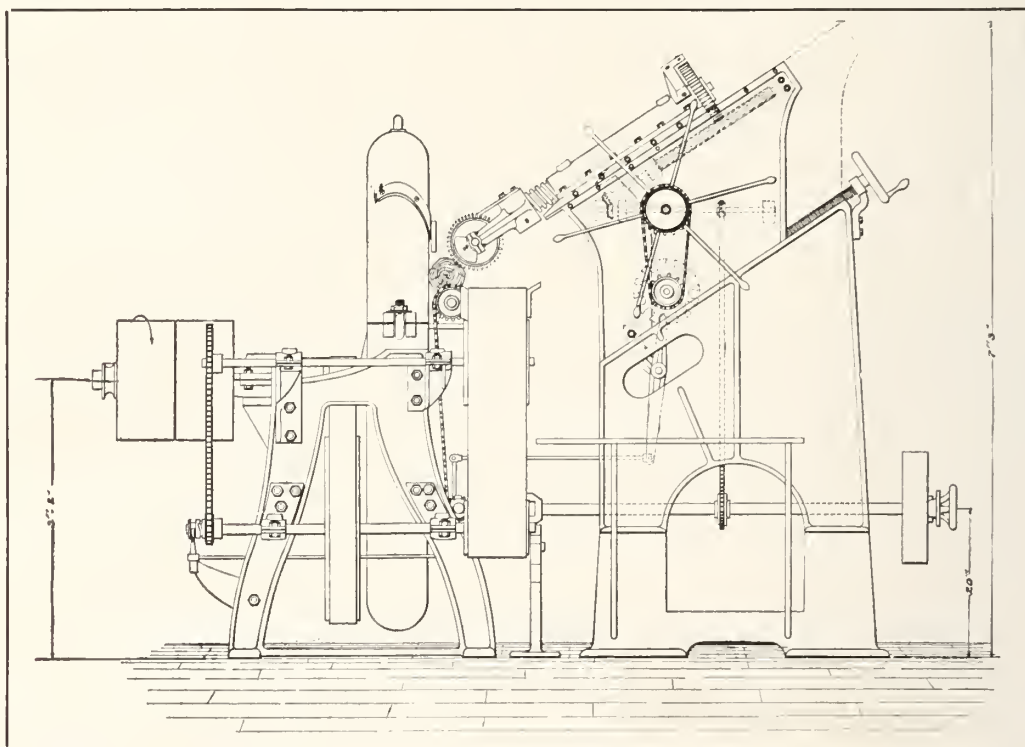
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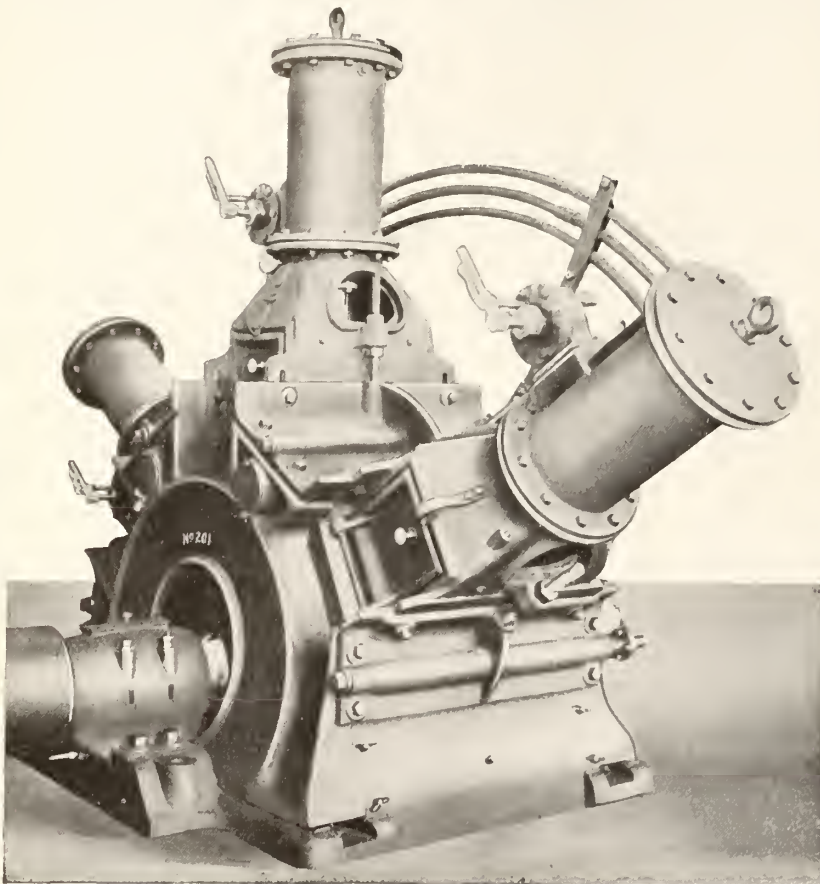


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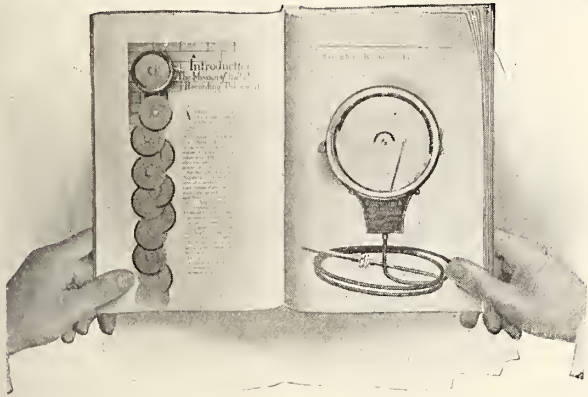
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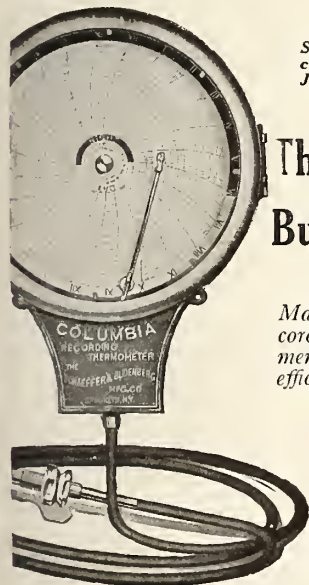
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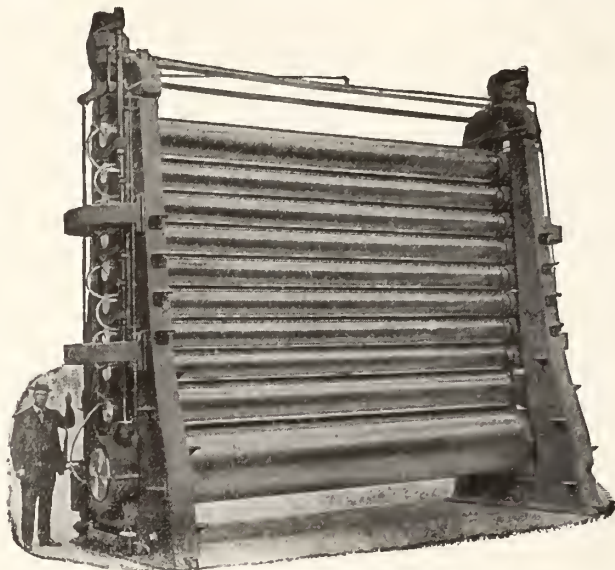
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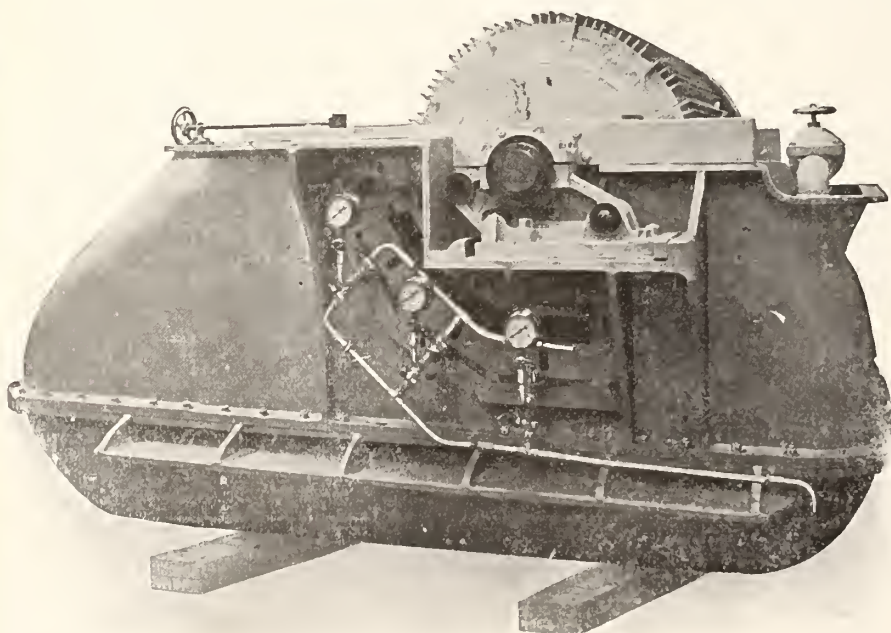


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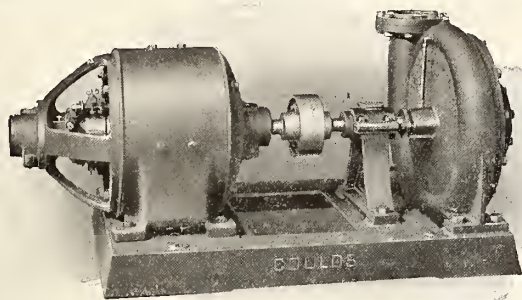
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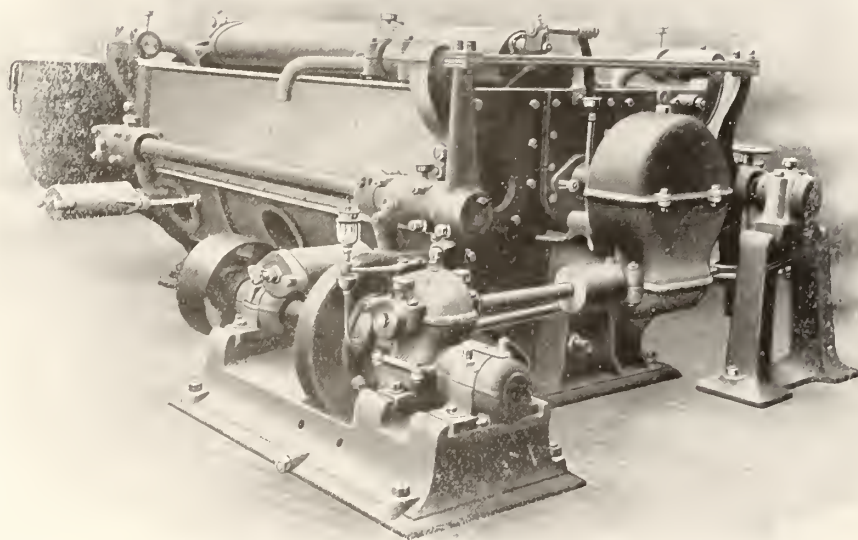
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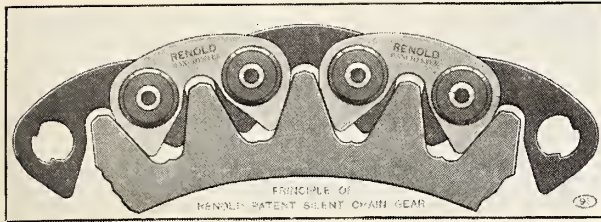
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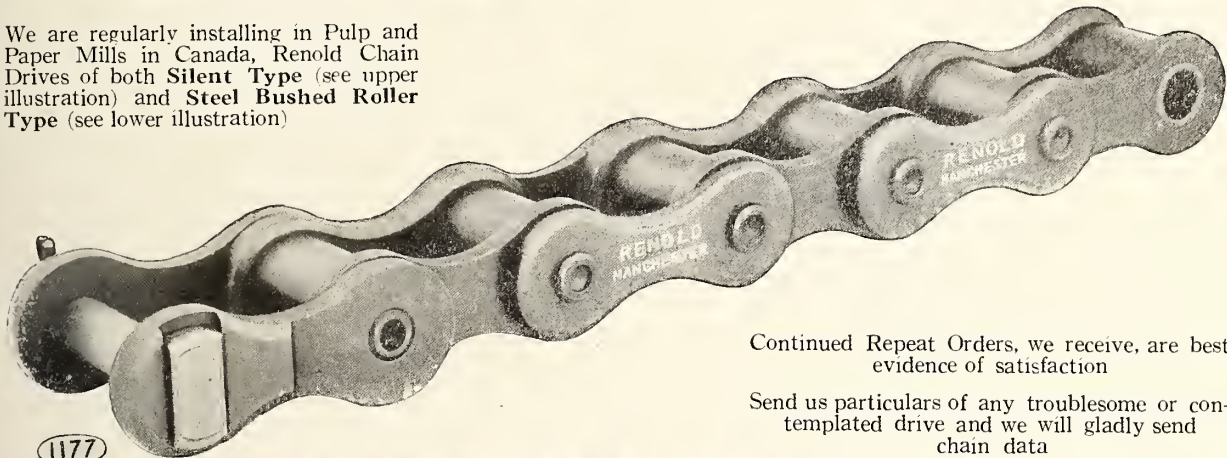
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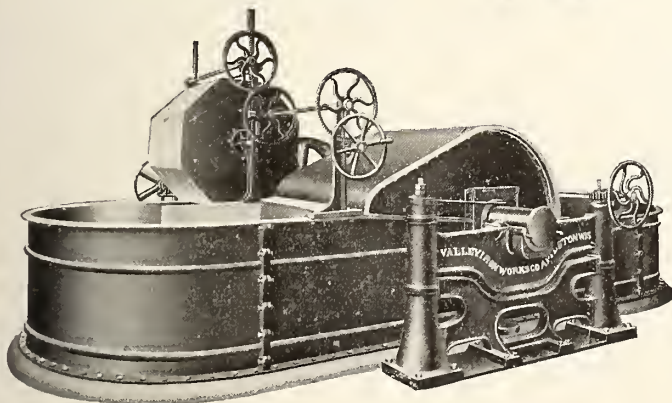
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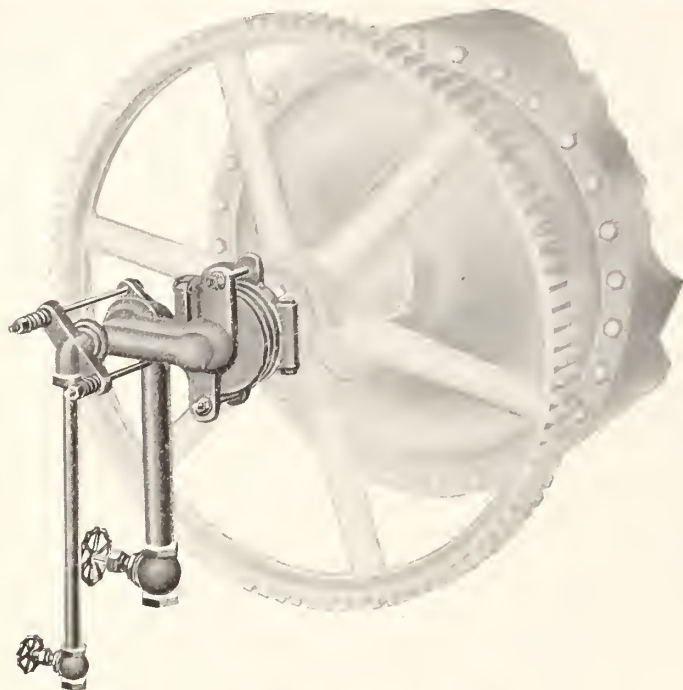
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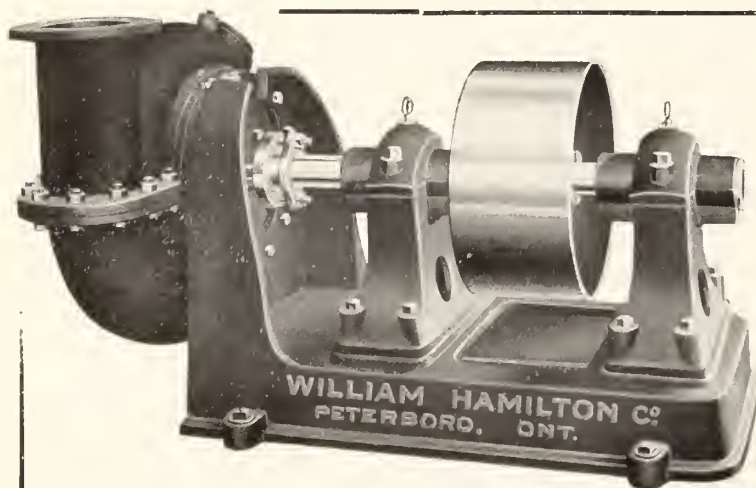
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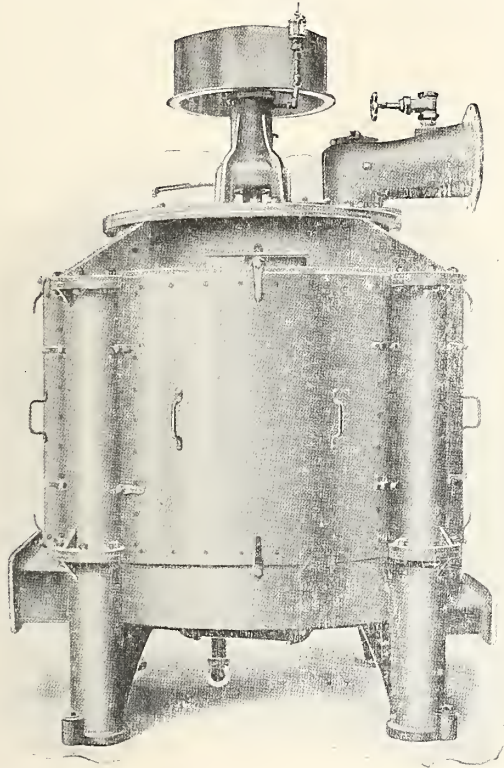
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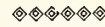
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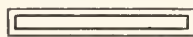
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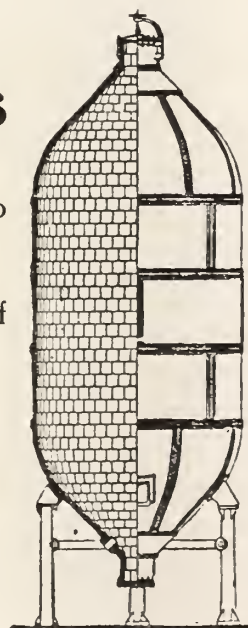
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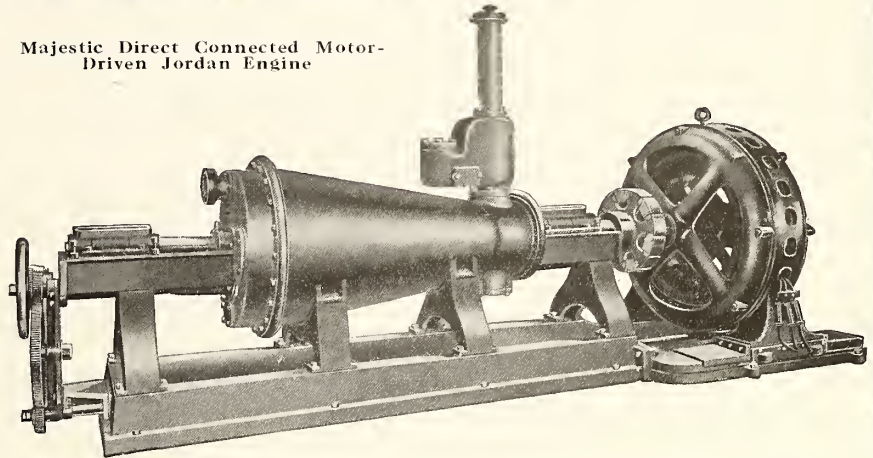


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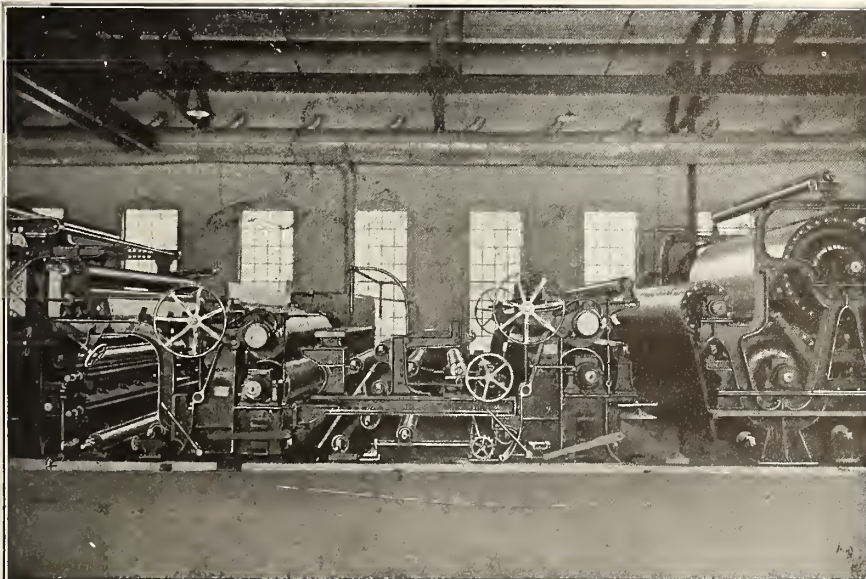
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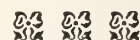
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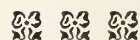
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VOL. XII.

MONTREAL, SEPTEMBER 15, 1914

No. 18

Cheerful but Careful

From all parts of the Canadian industrial world come reports that conditions are not nearly so bad as it was once feared they might become. While many lines of business are practically shut down, and charitable organizations are looking for a winter of unprecedented stress and activity, many trades and businesses are assuming almost normal proportions.

The Toronto correspondent of this magazine makes a statement which should bring cheer to the heart of almost all our readers, viz., that the large department stores are placing orders for a full supply of paper for catalogues. Those who are familiar with Canadian domestic and financial conditions, will realize that not only is this a welcome impetus to the paper industry, but it gives one of the best promises possible of good conditions in all parts of the country. The mail-order house is a very great factor in the distribution of goods from coast to coast.

* * * *

So far, despite rumors that a move would soon be made, there is no immediate prospect of the opening of the exchanges.

This is clear enough indication that, while conditions are bright, still, beyond the sunshine of to-day the weather is uncertain. The banks are taking no chances. This may be one underlying reason for the general optimism. The progress of the railways, the extension of credits, the possibilities of developments in export trade and the increase of Canadian manufactures are but a few of the influences that will have a bearing on the general situation. No man can predict with any degree of certainty what will be the movements of industry and finance in the near future. But all in all, the outlook is cheerful.

Practically without exception the pulp and paper manufacturers of the Dominion are quite confident and optimistic. The news market is holding well, and all other lines are firm. The demand for good qualities of pulp is keeping up satisfactorily, and orders by the score have had to be cut down or restricted by sulphite manufacturers.

About six weeks ago the available stocks of newsprint and sulphite began to be called into requisition. At the present time about fifty per cent of these supplies have been used up and it is probable that another six weeks will see the end of the stocks.

After this period has elapsed, there is almost certain to be a rise in the price of Canadian pulp. There is almost sure to be a steady increased demand, and conditions in general will have settled down to a new level far above that which has been in evidence in the Dominion. Some of the largest manufacturers state most sincerely that the present prices of newsprint and pulp are not excessive. Contracts in nearly all cases are being taken care of without any advance whatever and the only instance in which there has been the slightest raising of prices to those who have placed orders with pulp and paper manufacturers is where there may have been some vacillation on the part of the purchaser or lack of confidence in the manufacturer. It is only fair to state in this connection that Canadian manufacturers as a whole have been absolutely loyal to their bona fide contracts in the United States as well as in Canada and reports to the contrary or rumors that there will be a throwing off of responsibility on account of the state of war in Britain, are neither well founded nor fair. Wherever such fears may have influenced American purchasers, it is almost certain that they arose through misinformation or a rumor which in troublous times are

nearly always current. The stories of the mining of the St. Lawrence which found credence a couple of weeks ago, are of the same nature. The censorship which is being placed upon the military movements might well be placed over some of the reports on industrial conditions in the Dominion.

* * *

Nor will any contracts suffer loss through the efforts of Canadian manufacturers to find new markets. It is expected that the newsprint manufacturers will go ahead with their plans for the development of the South American trade. In this they have the full support of Sir George Foster, Canadian Minister of Trade and Commerce, who issued not long ago a bulletin urging Canadians to exert themselves to the utmost to make good their opportunities to secure the markets vacated by the Germans. Sir George points out in his bulletin that Germany even ships almost half a million dollars' worth of paper to Canada and there are beside the great fields which are now cut off from any export by the German nation.

It must be borne in mind, however, that South American trade will have to be well secured before it can be accounted sure.

A moratorium has been in force, and the industrial conditions have not been any too stable. It has taken time to build up Germany's foreign trade, and it will take time to do the same for Canada. Again, the war will not last forever, and it would be wise for exporters to see themselves well protected by proper contracts before venturing.

EDITORIAL COMMENT.

One of the most interesting developments of the present war crisis is the probability that German patents in Great Britain and the Colonies will be cancelled and thrown on the market by the respective Governments.

It is well known that in Great Britain the value of German inventions in the papermaking industry runs into millions of dollars, and in Canada not a few German devices and processes relating to paper making have been protected. In Ottawa, Montreal and Toronto there is already considerable activity among manufacturers, actual and prospective, and it would be no surprise if many devices which have heretofore been incomplete because of the basic nature of the foreign claims should be manufactured.

* * * *

In our present issue we have peculiar pleasure in presenting to our readers a thoughtful article by an efficiency engineer of wide experience, Mr. Edward J. Trimbey, M. E., of the Canada Paper Company. Mr. Trimbey has shown in his article that grasp of scientific investigation which is so refreshing to the man who wants accuracy and thoroughness in his work. It is an unusual method which Mr. Trimbley has pursued, and his results will find hearty appreciation throughout the industry.

For Improving Soda Pulp Production

(From the Forest Service, U.S. Department of Agriculture.)

Why some soda pulp mills are using from 10 to 20 per cent more pulp wood, from 50 to 100 per cent more chemicals, and from 10 to 40 per cent more steam, and require much larger plants and more labor for the same output per day than other mills, making a similar product is explained by the U.S. Department of Agriculture in a recently issued bulletin. The answer is to be found, in part at least, says the bulletin, in lack of knowledge concerning the effect upon the yield and quality of pulp of such factors as amount of caustic soda per pound of wood, duration of cooking, pressure or temperature of cooking, and concentration of the cooking chemicals.

Experiments carried on at the U.S. forest service laboratory with clear sound aspen wood gave yields of good pulp ranging from 10 to 25 per cent higher, than the better run of yields reported by pulp mills and in some cases with shorter cooking periods and less chemicals. Yields of well-separated unbleached pulps as high as 56 or 58 pounds per 100 pounds of wood can be obtained from aspen, says the department, if the wood is of the best quality. Yields of from 54 to 55 per cent were secured which required only from 10 to 11 per cent of bleach.

On the basis of the experiments it is stated that minimum cooking periods of from 3 to 4 hours may be used with aspen for bleaching pulps, provided the other cooking conditions are properly maintained. Greater severity of cooking is accompanied with a decrease in the yield of crude pulp, and usually of screened pulp. While the amount of bleach required decreases with increasing severity of cooking, a point is soon reached where such decrease fails to counterbalance the decrease in yield. Moreover, the decreased yields from more severe cooking result in a greater cost of wood and soda per ton of pulp.

Increasing the initial amount of digester liquor increases the condensation and steam consumption (and hence the cost) because of the greater volume to be heated. Increasing either the duration or pressure has a similar effect, because of the greater loss of heat by radiation.

From a study of the results of these experiments, says the department, it should be possible for a mill operator so to regulate the cooking process as to secure the largest possible yield of pulp of the desired quality at a minimum cost for chemicals, fuel, labor, and overhead charges, so far as the operation is affected by the cooking conditions considered.

In making prophecies as to the progress of Canada in the near future and after the war, the financial and industrial experts in all centres are laying great stress upon the assured prosperity of the pulp and paper industry. When other businesses are having difficulty the paper trade is almost certain to succeed well.

THE DRYING OF PAPER

By **EDWARD J. TRIMBEY, M. E.**

Efficiency Engineer with the Canada Paper Company

(Written Specially for the Pulp and Paper Magazine)

The proper drying of paper is a matter of considerable importance from the standpoint of both quality and economy. Various devices are in use to regulate the drying by controlling the temperature or the pressure, and there are various systems for removing the condensed steam from the dryers and for preventing the loss of steam from the dryers before condensation by the use of individual traps for each dryer, or by using larger traps for a number of dryers. The advantages to be gained in this way are well known but there are a number of other points in connection with the drying of paper which are of considerable importance but are not generally known.

Some time ago the problem of increasing the production of a certain machine making bag and manila papers was brought up and it was found that the production was held back on account of lack of drying surface. The question then arose whether the back pressure would be increased and if so, what increase would be necessary, and what effect would this have on the strength; should extra dryers be added; or would the addition of felt dryers, by removing moisture from the felts, increase the rates of drying.

Many tests have been made to determine the total amount of steam used by the dryers as a whole, either by metering the steam supplied to them, or by passing the condensed steam from them through a condenser and weighing it in open tanks, but no one seemed to have any definite information as to the rate of drying on the individual dryers, or as to the effect of back pressure or felt dryers. It would be rather a difficult matter to measure the amount of steam condensed by the individual dryers as to do so it would be necessary to use a separate condenser and weighing tank for each dryer, and also to provide some means of preventing the steam from escaping from the dryers before being condensed.

It was thought that the work done by several of the last dryers could be easily determined by taking samples of the paper going to the reel and drying out for per cent of moisture, and then by by-passing some of these last dryers, one at a time, and again taking samples for moisture. This method worked satisfactorily until two dryers had been by-passed but by that time the machine began to disappear behind the pile of "broke," and it was seen that some other method would need to be devised.

The method finally decided upon as the most feasible was to have the machine tender insert the "squirrel" about fifteen inches and cut off a strip twenty or thirty feet long, then draw the "squirrel" to the edge of the sheet, and, after waiting about ten seconds, repeat the operation. Starting back at the last dryer the back tender tore off this strip when it came through, and it was immediately placed in a covered can. The next strip was torn after passing the preceeding top dryer, the third strip after passing the next preceeding top dryer, and so on until the last sample was taken from the last press before coming to the dryers. Each sample as taken was placed in a covered can and as soon as possible a given amount was weighed and

placed in the drying oven where they remained until there was no further loss in weight. While these samples were all taken from the front side of the sheet and might not represent the average of the entire width of the sheet, the results obtained were relative and showed the increase in the percentage of bone-dry paper as the sheet travelled from dryer to dryer and, by computation the amount of water evaporated from the sheet by each dryer could be determined. Having found that this method could be used for making a detailed study of the rate of drying if desired, it was decided to first determine the relation between the strength factor and the steam pressure on the dryer header.

In order to eliminate variations in strength which would be due to variations in the relative amounts of ground wood and sulphite furnished these tests were made on a machine making a 100 per cent sulphite sheet. Tests were continued for ten hours a day for six days, taking samples from each reel made during

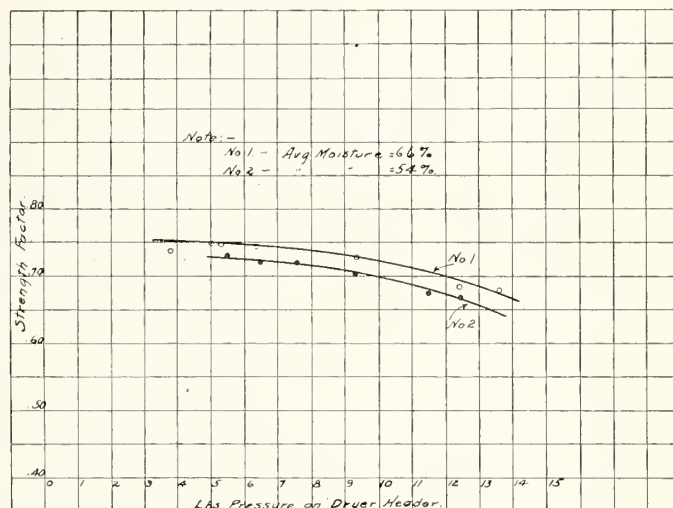


Fig. 1—Showing effect of moisture and pressure on the dryer header, on the strength of bag paper.

this time. Duplicate sets of samples were taken, one set being tested for moisture and the second set for weight and strength. The second set consisted of four sheets which were weighed together to obtain a fair average, and each sheet was then tested in four different places with the Mullen Tester, thus giving the average of sixteen tests for strength for each reel. The ratio between the bursting strength and the weight per ream on the 24in. x 36in—500 basis was taken as the "Strength Factor." The steam pressure on the dryer header was noted each time samples were taken.

While the object in view had been to determine the relation between the strength factor and the pressure on the dryer header it was found on working up the results of these tests, that the moisture in the finished paper had varied from 4.8 per cent to 8.0 per cent and

that the strength factor varied with the amount of moisture as well as with the pressure used for drying. The tests were accordingly divided into two groups, one group of thirty-five tests in which the moisture varied from 6.0 per cent to 8.0 per cent and a second group of thirty tests in which the moisture varied

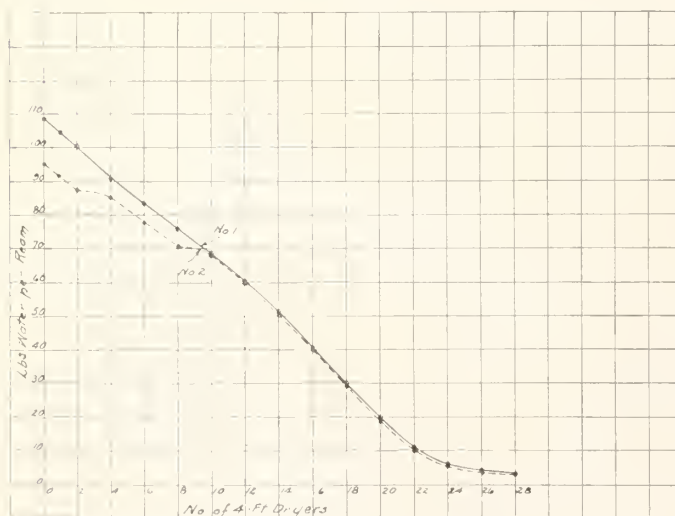
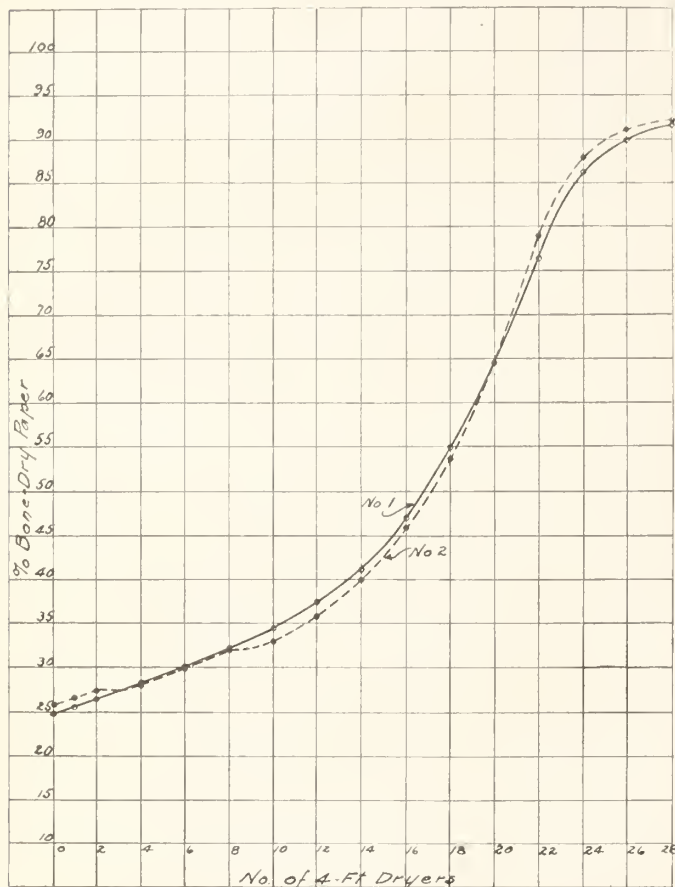
These curves show that while the strength remains fairly constant for pressures on the dryer header up to about seven pounds there is a rapid falling off when the paper is dried at a higher pressure; and also show that a reduction in moisture below six per cent causes a marked falling off in strength in addition to the loss due to the use of too high a pressure. With an average of 6.6 per cent moisture, the strength factor which is 74.5 per cent up to 7 pounds pressure on the dryer header falls off to 68 per cent at 13 pounds pressure, a loss of 8.7 per cent in strength, while when the average moisture in the paper was reduced to 5.4 per cent the strength factor was but 72.5 per cent at 7 pounds and 65.5 per cent at 13 pounds, showing a difference of 12 per cent in strength between a sheet dried at about 5 pounds pressure on the dryer header with 6.6 per cent moisture. This is about the difference which through the calenders. This series of tests was also one containing 25 per cent of ground wood.

To determine the effect of a greater percentage of moisture a second series of tests was made varying the moisture from 6.0 per cent to 8.6 per cent which was about as high as could be carried without danger of showing a water-finish effect in spots when passing through the calenders. This series of tests was also divided into two groups, one group of those containing less than 7 per cent of moisture and another of those containing 7 per cent or more. The results for the various pressures for these two ranges of moisture give curves which practically coincided, and were near enough to warrant the conclusion that when the percentage of moisture in the dried paper is from 6.5 per cent to 7.0 per cent a small increase in the amount of moisture does not materially affect the strength. A large increase in the amount of moisture would no doubt reduce the strength, though no tests were made to determine this point. It is quite likely that within practical limits the strength, would not be affected.

Having determined that it was not economical to increase production by using high back pressures, the next point investigated was the influence of felt dryers on the rate of drying. This was done by taking samples of the paper from each alternate dryer from the calenders back to the last press, as described above, and determining the per cent of bone-dry paper at each point. Fourteen tests were made in this way, seven tests with the paper passing over all of the dryers, and seven with the sheet by-passing the third and ninth dryers from the wet end.

The results of these tests are shown by Figs. 2 and 3. Both sets of tests were reduced to the same speed and pressure on the dryer header for better comparison: the average weight for the first series of tests when all of the dryers were in use was 24 in. x 36 in. x 500—39.2 lbs. and came to the dryers at an average of 24.9 per cent bone-dry, while for the second series of tests when the third and ninth dryers from the wet end were by-passed the average weight was 36.2 lbs. with an average of 25.9 per cent bone-dry paper in the sheet coming to the dryers.

In Fig. 2, which shows the per cent of bone-dry paper as the various dryers were passed, curve No. 1 corresponds to the first group of tests with all of the dryers actively, they continue equal on passing the 6th and 8th when two dryers were by-passed. Curve No. 1 shows a steady increase in the percent of bone-dry paper from 24.9 per cent when leaving the second press, to 91.8 per cent on leaving the last dryer. Curve No. 2 starts from the second press at 25.9 per cent bone-dry paper and continues parallel to Curve No. 1 while passing the



Figs. 2 & 3—Showing effect on rate of drying, of by-passing dryers to act as felt dryers.

from 4.8 per cent to 5.9 per cent. These groups were further subdivided into sets of five tests each, taking those having approximately the same pressure on the dryer header, and the average strength factor and pressure for these sets were plotted giving the curves shown in Fig. 1.

first and second dryers but drops off at the third dryer. While at the start No. 2 contained one per cent more bone dry paper than No. 1, at the fourth dryer they are practically equal containing 28.2 per cent respectively of water per ream. The pounds of water per dryers at the ninth dryer, which was by-passed, No. 2 again falls off and at the tenth dryer contains only 33.0 per cent dry bone paper as compared with 34.5 per cent for No. 1, when none of the dryers were by-passed.

This machine was equipped with dryer felts in two sections; on leaving the fourteenth dryer, where the first section ends, the 39.2 pound sheet which left the presses containing 24.9 per cent bone dry paper has reached 40.9 per cent bone dry with all the dryers in use, while the 36.2 pound sheet which left the presses containing 25.9 per cent bone dry paper has reached only 39.9 per cent bone dry with two of the dryers by-passed. After leaving the fourteenth dryer the percent of bone dry paper increases more rapidly in the second series of tests than in the first series and reaches 91.2 per cent on leaving the twenty-sixth dryer as compared with 89.9 per cent but this is due to its being a lighter sheet, with the speed and pressure on the dryer header the same in each case.

The curves in Fig. 3 show the reduction in the total weight of water per ream. The pounds of water per pound of bone dry paper have been computed for the paper leaving each pair of dryers and this has been multiplied by the bone dry weight per ream; this gives the total pounds of water in a ream of paper as it passes each pair of dryers and as the amount of water removed from the sheet is the measure of the work done by the dryers, these curves show the effect of by-passing more plainly than the curves in Fig. 2.

When none of the dryers were by-passed the average weight of the sheet was not only three pounds greater than in the runs with the dryers by-passed, but it contained one per cent less bone dry paper, and consequently more water. The pounds of water per pound of bone dry paper leaving the press being 3.01 as compared with 2.86. This gives an average of 108.4 pounds of water in each ream of paper as it left the second press in the tests when no dryer were by-passed, and only 95.3 lbs. of water per ream in the tests when two were by-passed. On leaving the fourteenth dryer the amounts were 51.8 pounds and 50.4 pounds respectively. In the first case 56.6 pounds of water had been removed while in the second case only 44.9 pounds. In the tests when no dryers were by-passed there was 60.1 pounds of water per ream on leaving the twelfth dryer, or 48.3 pounds had been removed by twelve dryers when the sheet passed over all of them as compared with only 44.9 pounds when fourteen were used and two of these were by-passed.

This proves that in by-passing a dryer to act as a felt dryer that the effect of the dryer is lost entirely for drying paper, and that the addition of a felt dryer to a paper machine would have no effect whatever, aside from increasing the life of the dryer felts.

By the use of the "squirt" as previously described, samples were taken from the last six or eight dryers, from the first dryer and from the last press. Having the pounds of water per pound of bone dry paper at the first dryer and when dried, the difference multiplied by the bone dry weight of the sheet gave the total pounds of water per ream removed from the dryers. This divided by the number of dryers employed gave the pounds of water removed per dryer per ream at the given speed.

After the sheet has reached 90 per cent bone dry it is more difficult to remove the last two or three per cent of moisture, so to make conditions uniform the range taken was between the wet paper leaving the press and paper dried to 90 per cent bone dry. To bring all of the tests to a common basis the pounds of water removed per dryer per ream was divided by 3000 (square feet in 500 sheets 24 in. x 36 in.) to give the amount per square foot of paper and this multiplied by the speed in feet per minute (if the speed were 400 feet per minute, each square foot of paper would be in contact with a given point on each dryer only one four-hundredth as long as it would be if the speed were one foot per minute). This gave "pounds of water removed per dryer per square foot of paper at one foot per minute," which is a basis to which all the tests could be reduced for comparison.

In this way tests were made on a number of machines and it was found that not only did the amount of water removed per dryer increase with the pressure on the dryer header, but that the rate of increase with an increase in pressure was not the same for different machines, nor for the same machine on different days.

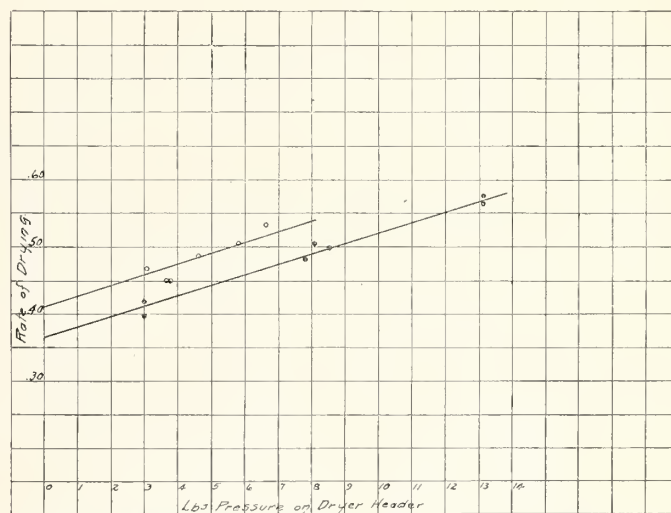


Fig. 4—Showing variation in rate of drying on different days.

Fig. 4 shows the results obtained on one machine on two different days, Jan. 15th and Feb. 16th. Each test is represented by a point, and while the tests taken on each day give points which locate a straight line, one line is considerably higher than the other and they are approximately parallel. The variation between different machines is shown by Fig. 5 which gives the relation between the rate of drying and the pressure on the dryer header for three machines. The rate of drying for No. 3 is nearly 30 per cent greater than for No. 1 and the two curves are approximately parallel showing equal increments for the same increase in pressure on the dryer header; for No. 2 the rate of drying is but little greater than for No. 1 at atmospheric pressure. These machines were equipped with one header supplying all the dryers and the gauge showing the pressure was connected at about the center. No. 1 and No. 3 were equipped with 28 dryers, and No. 2 with twenty dryers.

When the average rate of drying has been determined it is an easy matter to construct a set of curves which will give at a glance the approximate pressure on a dryer header which it is necessary to maintain to a given degree of dryness when coming to the dryers.

The condition of the felts, the weighting of the presses, the character of the stock, etc., determine the degree of dryness to which the sheet will be pressed, so if a set of curves have been determined for any machine on the assumption that the sheet will be, say 30 per cent bone dry, coming to the dryers, these curves can be

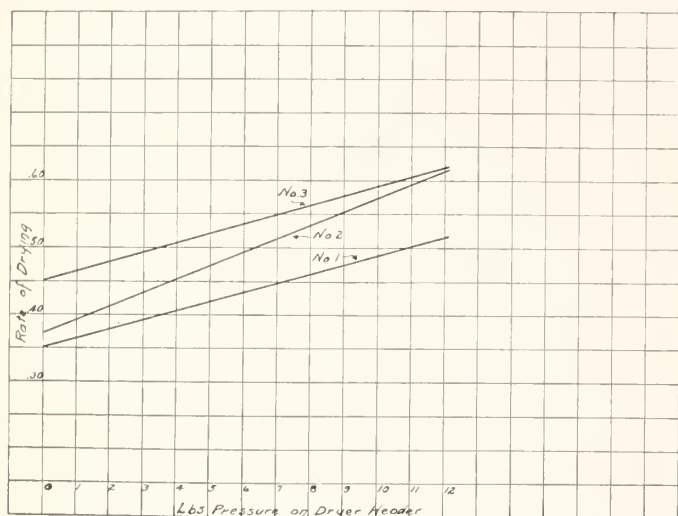


Fig. 5—Showing variation in rate of drying on different machines.

used as an indicator of the degree of dryness which is actually obtained; for if the sheet is less than 30 per cent bone dry it will require a higher pressure on the dryer header to properly dry it than will be shown for the actual weight and speed. Fig. 6 gives a set of curves for the machine No. 2, the rate of drying of which is shown in Fig. 5. In making the computations for these curves it was assumed that the paper would be 3 per cent bone dry coming to the dryers, and that it would be dried to 90 per cent bone dry paper on leaving the third active dryer from the calender end; thus leaving two active dryers to complete the drying

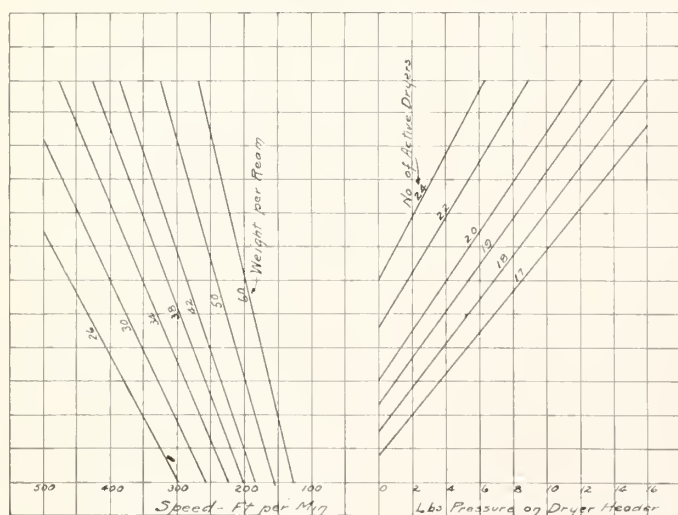
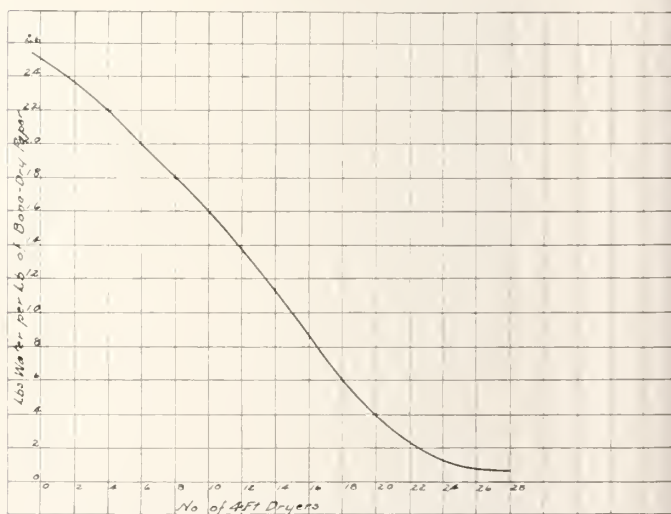
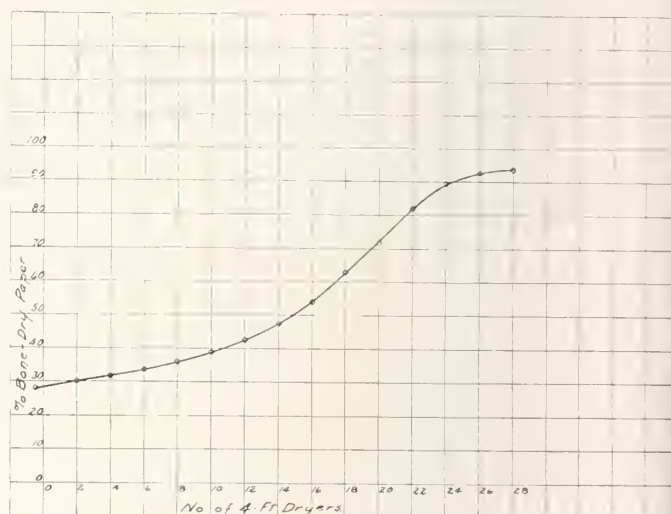


Fig. 6—Showing pressure on dryer header necessary to dry paper of given weight at given speed.

from 90 per cent to about 94 per cent. To use this set of curves assume that the machine was running 300 feet per minute and making a 36 pound sheet, what pressure on the dryer header would be necessary if no steam was used in the last dryer, leaving nineteen active dryers, and keeping the last dryer

cool to improve the finish? Finding the intersection corresponding to 300 feet and 36 pounds and projecting to the right until we cut the line marked "nineteen active dryers" we find approximately 3 pounds pressure. Now supposing that we wish to increase the speed to 400 feet per minute while running a 36 pound sheet and wish to by-pass one dryer to act as a felt dryer, and also to run the last dryer without steam, how many extra dryers would need to be added to the machine so as not to exceed 6 pounds pressure on the dryer header? Using the curves as before we find that it would require twenty-two active dryers, or twenty-four dryers in all.



Figs. 7 & 8—Showing rate of drying.

Fig. 7 shows the results obtained by applying the "squirt" method of investigating the rate of drying on a new machine making a 31-pound sheet at a speed of about 460 feet per minute, with a pressure of 5 pounds on the dryer header. This machine was equipped with twenty-eight four-foot dryers and a "baby" dryer, but no steam was used in the last dryer. This curve shows how the per cent. of bone-dry paper increase as the sheet travels from the presses to the reel. It is the average of two test made on different days.

Fig. 8 may be termed the reciprocal of the curve shown in Fig. 7. It shows the pounds of water per pound of bone-dry paper contained in the sheet on leaving the various dryers.

Fig. 9 shows the pounds of water removed per pound of paper per dryer at the given speed. With the exception of the first few dryers the points obtained determine a smooth curve. In testing the samples for per cent. of paper it is difficult to get results within one-fourth of one per cent., especially from the first few dryers when the sheet is about one-third paper and two-thirds water. An error of this

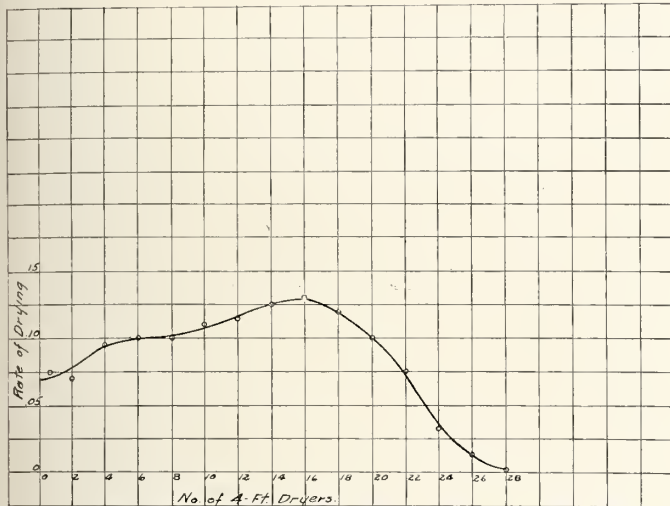


Fig. 9—Showing pounds of water removed per pound of paper per dryer.

amount is not noticeable on the curves given in Fig. 7 or Fig. 8, but would cause an error of from twenty to thirty per cent. in the value for that particular dryer in the curve shown in Fig. 9.

Fig. 10 is similar to Fig. 7, being the average of the results of two tests on a News machine making a 32-pound sheet at about the same speed. In this case the machine was equipped with thirty-six four-foot dryers and a "baby" dryer. This curve is shown for comparison with Fig. 7 to point out a common source of loss in connection with paper drying. A study of this curve shows that the sheet left the

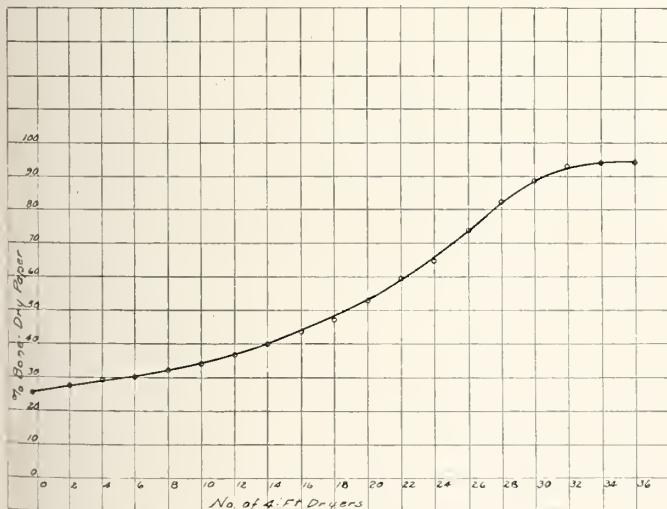


Fig. 10—Showing rate of drying.

presses at approximately 25 per cent. bone dry paper, reached 90 per cent. on leaving the thirty-first dryer and was about 94 per cent. on passing to the calenders. The point to be noted is that while in Fig. 7 the sheet had reached 30 per cent. on leaving the second dryer,

it did not reach 30 per cent. in Fig. 10 until it had passed part way over the sixth dryer, or, compared with Fig. 7, the steam used in three and one-half dryers in Fig. 10 was wasted and this is about 10 per cent. of the total steam used. Fig. 7 shows poor results from the presses as it is not at all uncommon to find the paper as dry as 30.5 per cent. to 31 per cent. bone-dry when coming to the dryers on two-press machines, and 30 per cent. should be maintained on the average. If the sheet in Fig. 10 had been pressed to 30 per cent. before coming to the dryers the steam used in the first five and one-half dryers would have been saved, thus saving 17 per cent. of the total steam used in the dryers, which would be a large percentage of the extra live steam needed for drying.

In Fig. 11 is shown the cost of evaporating this excess water left in the sheet when it comes to the dryers at less than 30 per cent. The assumptions made in computing these curves were that live steam would be needed to evaporate this excess water, that the finished paper was to be 92.5 per cent. bone-dry, that 1.33 pounds of live steam at 212 degrees F. and atmospheric pressure would evaporate one pound of water from the sheet, that 7.5 pounds of steam from and at 212 degrees F. would be obtained per pound of

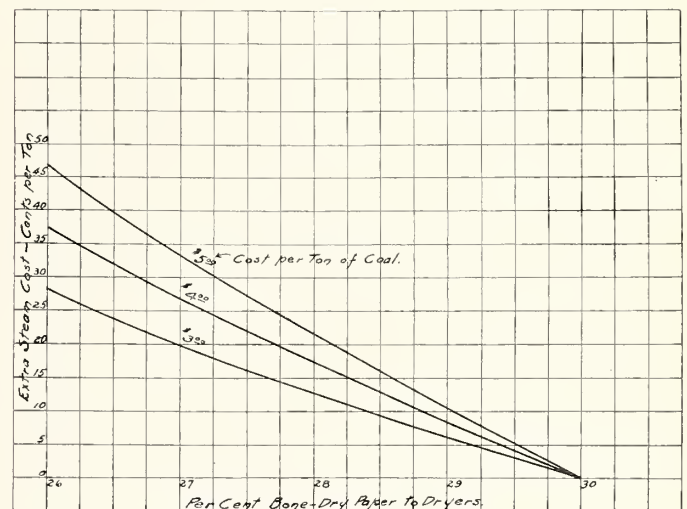


Fig. 11—Showing extra cost of drying paper when not properly pressed.

coal, and that ten per cent. of "broke" would be dried. With these assumptions for a basis, curves were drawn showing the extra cost for steam with coal at \$3.00, \$4.00 and \$5.00 per ton of 2,000 pounds. When it is seen that with coal costing \$5.00 per ton it costs twenty-seven and one-half cents per ton, or from \$8.00 to \$13.00 per day on one average News machine for live steam to dry the sheet from 27.5 per cent. bone-dry paper to 30 per cent., this is a stronger argument in favor of keeping the presses in condition to remove this excess water before the sheet comes to the dryers. A low "felt cost per ton" which is obtained by using as little weight as possible on the presses is poor economy, as the extra coal burned to produce the steam necessary to evaporate the excess of water will cost many times the saving in felt cost. It is quite a common thing to find machines on which, owing to the poor condition of the press rolls or light weighting of the presses, the paper is going to the dryers at from 25 per cent. to 28 per cent. bone dry paper. It is also quite common to find the paper dried to 95 per cent. or 96 per cent., or even as dry as 98 per cent.

bone dry when going to the reel, with a consequent loss of steam and at the same time the strength and "life" of the paper are partly destroyed by the excessive overdrying.

The effect which dryer felts have on the rate of drying is another point about which there seems to be no definite information. The argument is sometimes advanced that a sheet will dry faster, and with less pressure on the dryers, if no dryer felts are used as there will be a better opportunity for the moisture to leave the sheet. The other argument is that drying will be more rapid with dryer felts by reason of the felts holding the sheet in closer contact with the hot surface of the dryer. The latter argument is the one which proves out in practise. Some tests made on a machine making mill wrapper, both with and without a top dryer felt, showed that for the same speed, weight per ream, and per cent. of moisture in the paper going to the dryers that 10 pounds pressure on the dryer header was necessary with the top dryer felt in use, and 15 pounds pressure when the felt was removed.

Another set of tests showing the effect of the more intimate contact of the sheet and the dryer surface

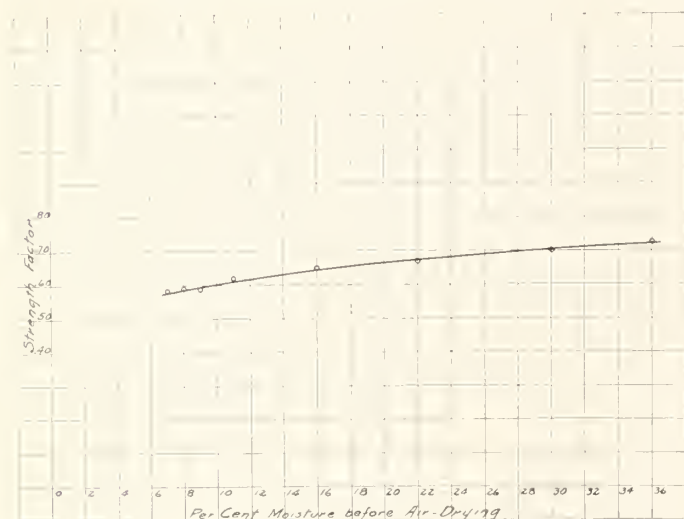


Fig. 12—Showing increase in strength when paper completes its drying at room temperature.

was made on a machine making "Newsboard." The dryers were in two sections, the first half supplied with exhaust steam and the last half with live steam. At one time screen plates with slots 0.060" were used and consequently there were many lumps in the sheet which would tend to hold the sheet from the dryers. When these coarse screen plates were replaced by others with slots 0.027" it was found that for the same speed and per cent. of moisture going to the dryers, a 5 per cent. heavier sheet was dried with a pressure of 9 pounds on the dryer header of the first section of dryers, and 8 pounds on the header of the last section, than had been dried with pressures of 12 pounds and 31 pounds respectively, when the screen plates with 0.060" slots had been used.

In a translation from the "Wochenblatt für Papier-Fabrikation" a description was given of the manufacture of boards on a Fourdrinier without dryer felts, stating that in this way the cost of production of cheap qualities of boards may be materially reduced and a softer, more absorbent and porous board obtained. The article explains how the wet sheet can be handled so as to do without dryer felts, but it is a question

whether the saving in felts would not be more than offset by an increase in the cost of drying. The article also mentions the running of the web straight from the coucher to the drying cylinders without passing through the presses; while this may be necessary in order to produce certain grades of soft boards, the greatly increased cost of evaporating the large amount of water in the sheet going to the dryers would prohibit this method of operating except in cases where an especially soft board was desired, or where the management failed to realize what an expensive way this was in which to save the cost of felts for the presses.

Fig. 12 is of interest even though it may have no practical application. It shows the increase in strength factor in a bag paper when the sheet is taken from the dryers containing various amounts of moisture and is then allowed to complete its drying at room temperature. There is a fairly uniform increase in the strength factor from about 58.5 per cent. when the drying is completed on the machine, to 72.5 per cent. when the last one-half pound of water per pound of paper is allowed to dry out at room temperature.

A number of articles on the drying of paper have recently appeared, treating the subject from both the practical and the theoretical standpoints. If any of the readers have made similar tests along these lines, or if this method of studying the rate of drying is adopted by other investigators it is to be hoped that they will publish the results obtained by them.

QUICK RUNNING CALENDERS.

Although rapid running of the calenders looks like making plenty of output, it has its difficulties in paper making, especially as there is a tendency to run the calender faster than it was built for. This may be all very well in the case of strong and elastic papers, and so long as only they pass through the calender. When, however, different sorts of papers, including weaker ones are run alternately, and of course, when it is a question of weak papers only, the speed must be reduced to correspond to the strength of the weakest paper. But it is practically impossible to keep on varying the speed for different sorts of paper, and the difficulty is accentuated by the fact that if the calender is run fast the pressure between the rollers must be heavy, or else the web has not the time to receive the necessary gloss. This heavy pressure makes the effects of any creases or inequalities of thickness in the paper absolutely permanent.

Fast running is also not without its effect on the calender itself. The stress on the bearings makes them very likely to run hot under the heavy load, and so great care is required in the lubrication, and that may even prove inadequate to prevent seizing or injury to the machine.

There is yet the further danger that the pressure may crush the paper so much as to affect the felting, and, therefore, the strength of the web. This is often manifested by a glassy look through, which it is impossible to attribute to any cause, whether imperfect sizing or otherwise that can be alleged. Yet may be mentioned. If the calender is running at a high speed, and it is necessary to stop it quickly for any reason, it is difficult to do so, and the braking strains the whole machine very severely. It must be evident from what has now been said that a quick running and a slow running calender should be provided, and that each should be restricted to the work which it is constructed to perform.—Papier Zeitung.

WHO'S WHO IN THE CANADIAN PAPER TRADE

W. P. Gundy, Vice-President and Managing Director Kinleith Paper Mills Company.

By W. A. CRAICK.

(Written Specially for Pulp and Paper Magazine.)

The managing director of the Kinleith Company is perhaps better known as general manager of W. J. Gage & Co., Limited, the big firm of manufacturing stationers and school book publishers of Toronto. At the same time his connection with the paper industry is by no means simply a nominal one. Mr. Gundy takes a very close personal interest in the management of the St. Catharines paper mill, and its successful development under his direction is testimony to his ability as a paper manufacturer.

The eldest of four brothers, all of whom occupy positions of prominence in the commercial life of Toronto, William Pearson Gundy was born fifty-six years ago in St. Catharines, the son of the Rev. S. B. Gundy, a Methodist clergyman. Mr. Gundy, sen., was subsequently moved to Toronto, where he became in time chairman of the Toronto Conference, but his untimely death when his eldest son was only fifteen years of age, left the latter face to face with the necessity of going at once to work. Employment was secured for him in the office of the Queen's Printer for Ontario, a position then occupied by the late John Notman, and young Gundy began the business career in which he is still actively engaged.

To John Notman, Mr. Gundy gives credit for much of the success that subsequently came to him. The Queen's Printer was a shrewd, hard-headed and highly competent official, and he instilled in the mind of the lad methods and principles that have been of the utmost value. In his department, Mr. Gundy remained until he was twenty-three years of age.

In the early eighties, it will be remembered, there was a great exodus of young Canadians to the United States and the future general manager did not escape the infection. The civil service had little to offer him in the way of advancement, and he determined to ask Mr. W. J. Gage for one. He had already known his future employer for some time, and considered that a word from him would be effective. So he went to small establishment on Wellington Street West, and preferred his request. Mr. Gage, on learning his intention, threw out the suggestion that he might do better if he remained in Toronto, and offered him a position on his travelling staff. The offer was accepted, and the erstwhile clerk in the office of the King's Printer was transformed into a drummer.

Mr. Gundy's career from that day right down to the present time has been continuously associated with the Gage business. A year after he first went on the road for the firm, he was sent to Winnipeg to open and manage a western branch. Two years later he was recalled to Toronto and in 1890 was made manager. In 1893 he was taken into the firm as managing director, a title which he held until two years ago, when he was designated vice-president and general manager. During these years he witnessed a tremendous expansion in the business of the company. When he was first employed by Mr. Gage, the number of lines handled was considerable. To a general book business there was added miscellaneous

fancy goods, stationery and school supplies. The manufacturing end was comparatively small and unimportant. As the turnover grew, first one and then another department was dropped, the firm concentrating its activities on the production of a larger and larger proportion of their own manufactures. To-day the business is almost entirely self-contained, the manufacture of school books and stationery being the main concern of the management.

Mr. Gundy's association with the paper manufacturing industry dates back nine years. With the



development of manufacturing, the necessity of securing a steady supply of paper made itself felt. It was not that the price of paper was excessive, but simply because it was often difficult to get particular makes just when they were needed that led to negotiations being entered upon with the Kinleith Company. The latter business was acquired in 1905, and a new company formed in which the officers of the Gage Company became the sole shareholders. Mr. Gundy was appointed vice-president and in his hands was placed the general management of the business.

From the very outset the general manager began to take a personal interest in the Kinleith paper mill. He arranged to make a weekly visit to the plant, which he has paid regularly ever since. He undertook to master the technique of the process, and to familiarize himself with the details of the paper trade. From time to time improvements were introduced and the mill enlarged. To-day it is one of the best equipped mills in the country making book, writing and bond papers, of which a large proportion is consumed by the Gage Company.

Among the manufacturers of Toronto, Mr. Gundy may well be regarded as one of the most public-spirited. He has not confined his attention solely to his own business, but has found time for the discharge of other duties. Thus a few years back he held office acceptably as chairman of the Toronto branch of the Canadian Manufacturers' Association, while this year he is filling the position of president of the Toronto Board of Trade, with its unusually onerous duties most efficiently. He has been twice a delegate to the Congress of Chambers of Commerce of the Empire, once at Montreal and once in London.

Mr. Gundy's favorite diversion is hunting and, he greatly enjoys an expedition in the fall of the year, with two or three congenial spirits into the woods of Northern Quebec or Ontario after big game. Fishing likewise appeals to him, and this is a sport for which he usually finds a little time in the spring. For the rest he plays golf, being a member of both the Lambton and Rosedale clubs in Toronto, and also travels a good deal.

When asked to make a few observations on the conditions and needs of the paper industry, the managing director of the Kinleith Company said, "I feel that one thing of which the industry stands in special need is a much closer supervision on the part of the customs officials of the imports of paper into this country. I believe that for tariff purposes there is a good deal of under-valuation going on. The Government could render no better service to the industry than to see that the Customs Department makes an exact valuation of imported lines of paper. It simply means that while we have a tariff that enables us to manufacture paper in this restricted market that can compete in price with paper of similar character made in the United States or England, we lose the benefit of this protection when Canada is made the dumping ground for the surplus production of foreign mills, sold here at prices below those prevailing in the home market.

Also at this particular time I think that all our Canadian paper mills should carefully study the imports from abroad, which are now shut off by the war. It may be that they are only temporarily stopped, but it remains for Canadian manufacturers to say whether or not they shall be permanently shut out. We can accomplish this in a measure by turning our attention to supplying lines made in Canada to take the place of those imported. We may not be able to make the same goods, but we can make substitutes, and in this way help to solve the problem of unemployment."

Mr. Gundy, who is president of the Toronto Board of Trade, has been active in arranging for conferences of municipal authorities to devise means of supplying employment during the present financial crisis, has some very definite views as to the duties of Canadian manufacturers in general. He feels that it is incumbent on every employer to do his utmost to keep the wheels turning and considers that the man who re-

fuses to do his duty by those dependent on him is as great an enemy to his country as the soldier who turns tail and runs. Eventually he hopes to see Canada derive a great and lasting advantage from the war.

The Leipzig Exhibition

(The following illuminating sketch of this famous exhibition is written by M. Olivier Rolland, of the well-known Canadian firm of bond and writing paper manufacturers. M. Rolland came from the centre of present hostilities after war had been declared.)

Leipzig is the leading city of Germany in the book and stationery trade. It is an intellectual centre, possessing the highest Court of Justice, and one of the most important universities of the German Empire. Its population is 600,000.

The exhibition was held under the auspices of the "Deutscher Buchgewerbe-Verein," on the occasion of the 150th anniversary of the foundation of the Book Industry Royal Academy. It was to have lasted until October. There was told the history of Graphic Arts. Walking along and visiting the pavilions,



Centre of the Exhibition.

one could follow its progress: beginning with the time when men engraved stone; following its work through 5,000 years; and finally reaching the perfection of our modern industries. All nations had contributed to the success of this exhibition: Great Britain, France, Russia, Italy, Austria had each erected their building on the Avenue of Nations; and in the international palace, Switzerland, Holland, Denmark, Belgium, Sweden, Norway, Spain and Argentina were represented.

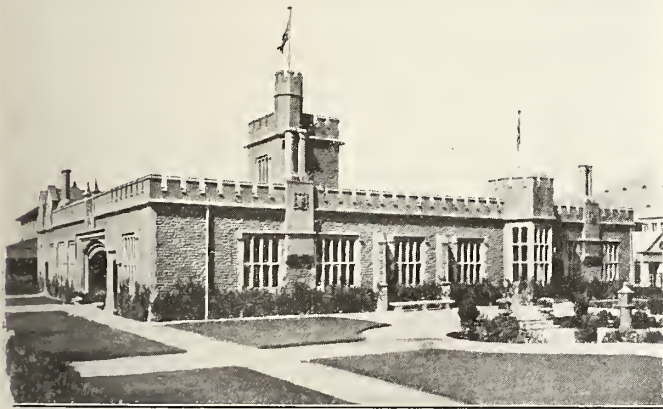
This magnificent tribute to civilization is now upset by war.

Six hundred learned men had co-operated under the direction of Mr. Lamprecht of Leipzig, to elaborate this plan, intended to show the progress of Graphic Arts, amongst all nations and all ages. The visitor could follow step by step, its march through centuries. It was a complete success.

Stone was the first material used for writing purposes. One could see various inscriptions of symbolic character engraved on stone. This was before the appearance of any alphabet; when animals and all sorts of fantastic figures, served as the expression of

men's thoughts. America held a prominent place in the ethnographic section. A vertical plan of a "pueblo" which used to be the residence of a whole "Smala" in South United States, was shown, rich in inscriptions. A very old form of writing was illustrated by a group of Polynesians being tattooed. The Hieroglyph, in the Egyptian section, showed a decided step towards progress. There could be seen a reproduction of the famous Rosette tablet, whose original is in the British Museum, and by means of which, Champolion discovered in 1819, the key to the Hieroglyphic writing.

There was shown a reproduction of Chinese classical literature engraved on the stone of the Confucius temple, in Peking. The appearance of parchment marks an important forward movement. Made of the skin of animals, this material, which may be regarded as the oldest substitute of paper, was invented in the 400th year B.C. Numerous specimens were exhibited. In the art of printing, Korea was represented as the country using the first movable types. The fine Japanese manuscripts and prints from engraved wood exhibited showed that this nation was the cradle of art, in this industry.



Great Britain's Building.

Next in the exhibit was the substance which is the nearest to our paper: "Papyrus," upon which Egyptians used to write. Books made of this material were also exhibited. Greek and Roman antiquity was revived with a display of ancient writing instruments, such as the "stilus," "Calamus"; also precious documents, treaties, Judges' tablets, etc.

It was by the end of middle ages that paper reached Italy, and from that country, was introduced into Europe.

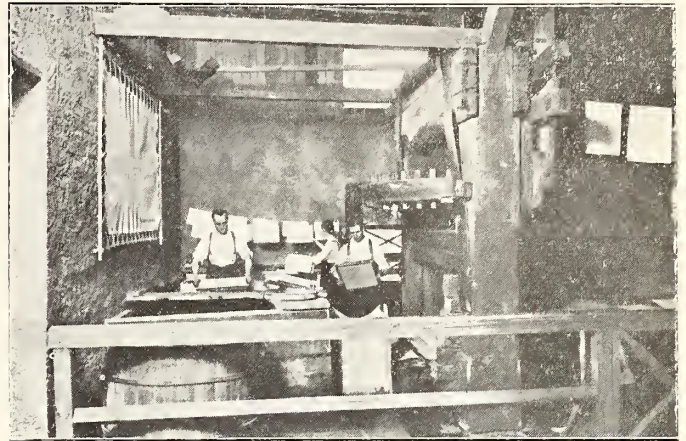
China, which is now considered as such a backward nation, was nevertheless the land where papermaking and printing were invented: Tsailun invented paper in the year 123 B.C.

Manuscripts of middle ages showed a beginning of luxury, with ornaments of colored and gold initials, and various paintings. In that time, copies of literary productions were transcribed by professional copyists. Instruction was confined to a limited number, but it was with the highly valuable invention of Gutenberg in 1454, that knowledge could be spread amongst all classes. To illustrate the importance of that discovery, a complete printing office of that time was reproduced in the Exhibition.

Following this innovation, progress in the printing art seems to have been wonderful. The first news-

paper ever published appeared by the end of the 16th century. During the 17th century, engraving on wood was practically all replaced by copper engraving, a display of which appears in a shop window of an old Leipzig merchant of the "Hoanman Court."

A special room was provided in honor of Breitkopf, the first to print the German types and the modern



The Hand-Made Process.

music notes. Some of the oldest editions of the German classical authors, Goethe and Schiller, published in the 18th century found interesting exhibits.

The next exhibit in the series were those of the modern times, with the inventions in the 19th century, of the mechanical press by Frederick Koenig, and that of lithography by Alois Senefelder. The press with which the London Times was printed for the first time November 29th, 1814, was reproduced by the firm Koenig and Bauer. Various documents were in place to show the whole history of commercial papers.

No visiting papermaker would fail to go through the old paper mill; a reconstruction with all historical fidelity, of an ancient manufacture of Hainsburg. There, the pulp was hammered with mechanical wood



The Old Paper Mill.

mallets, the paper sheet formed by means of moulds; it represented the real "hand made" process of old. The paper was also printed with a press of the "Gutenberg" style. Also of great interest was the exhibit of the first paper-making machine for the production of a continuous sheet of paper, invented by the Frenchman, Henri Robert.

The last word of perfection embodied by a modern and complete paper making plant: improved Hollanders, and an up-to-date paper-making machine were to be seen at work, producing paper, which was printed in the next hall, by means of a rapid rotary press of the well-known firm of August Scherl of Berlin. This shows the triumph of Industry, the victory of Science.

The visitor had the impression of living in a few hours the life and progress of the world, with the history of Graphic Arts.

I was told that the exhibition ground is part of the field which was witness of the great Leipzig battle of 1813. There the army of Napoleon was defeated by the Allies, whose number, it is fair to say, was twice that of the French force. A huge and costly monument commemorates that victory, which cost the life of over 100,000 men.

It is to be expected that with the perfection of modern arms, the battles of 1914 will show a much greater number of victims. These improvements are another but very different form, of progress and civilization.

THE CORNISH CHINA CLAY INDUSTRY

By W. TRETHEWAY.

The fears foreshadowed a short time ago as to the consequences that would ensue upon the china clay industry of Cornwall in the event of a European war, have unfortunately been realized. The home trade in china clay is comparatively small when it is considered that nearly one million tons are produced every year. As regards the trade to India and other Oriental countries, such as Japan, business has greatly increased in recent years, but this trade will be very precarious in consequence of the dangerous uncertainty of the sea routes to the Far East. The china clay trade to the continent has been enormous, and the declaration of war dealt it a severe blow. Russia and Germany were amongst the best customers of the Cornish china clay merchant. Of all the firms doing a continental trade, the West of England and Loring and Co. were probably doing the largest. Hence they are affected to a greater extent than others by the sudden suspension. The financial aspect is also a serious matter, the Cornish clay merchants have to face, as it is computed that the Continent has invariably something like £100,000 upon the usual credit terms, and not only have shipments been suspended, but an enormous amount of money is held up, with no immediate prospect of payment for many months to come, if the bulk of it is ever paid at all. All over the mid-Cornwall china clay field, there are signs of the effect of the war, and it is most unfortunate that such a set-back should occur so soon after last year's strike.

The outlook at the commencement was so unpromising that the West of England and Great Beam China Clay Company, which employ about twelve hundred workers, decided to close down the whole of their works. Fortunately, the situation has so improved within the past few days that the West of England Company has undertaken to find employment for their married workers throughout the war. This will mean that the company will at a great sacrifice of £800 a week, provide employment for the whole of their married men, not in producing clay for shipment, but mainly on development, a good deal of which could be in the ordinary way distributed over many years. This arrangement is essentially a special one, and has given considerable gratification in the district. It affects nearly 800 men, and as far as the single men are concerned, they must seek other spheres whilst the war lasts. The one bright factor in the industry which is raising the hopes of those vitally con-

cerned is the present activity of the American and Canadian markets. Whether this activity will be continued or only the result of the natural foresight of our customers to stock clays now the Atlantic routes are clear in case of any future eventualities. The fact remains that Fowey, the principal Cornish shipping centre, is once more throbbing with activity and the large direct steamers are carrying away their burdens of 6,000 tons and upwards.

Through the necessity of draught horses for the army remount department the china clay carriers have lost some of their finest specimens, and nearly 200 horses have been accepted for heavy draught artillery work. The patriotic spirit of the carriers was commendable, and in the early stages of the war, as the carriers proceeded through the town of St. Anstoll with their teams drawing their usual loads of about 5 tons, those animals which came up to the standard, were willingly unharnessed, and in many cases with an affecting farewell, for the clay carrier loves his horses, and keeps them well.

In conversation with one of the most prominent clay merchants of St. Anstoll, I was informed that the declaration of war brought an immediate cancellation of shipments on the one hand and remittances on the other. That stoppage will be continued as far as the continent is concerned is apparent, but it is exceptionally unfortunate at this time of the year when larger quantities are being sent there, especially to Russia, where several ports are closed during the winter months. It is very gratifying to learn that arrangements have been made for promptly resuming shipments to America, our largest single customer. This will allow for the continuous employment of a very large proportion of the men, and in due course money will again flow into the district. It is possible that England and America will have to a very large extent to provide for a time the wants of the world for paper. Certain qualities of clay, which have been used by Russia and Germany will probably suffer a serious decline in value, and these clays may have to be sold at a moderate price. The moratorium is being availed of in many districts and it is quite uncertain of course, when large amounts are owing from Germany especially, and Russia and Belgium in a less degree, will be paid. In all probability, France and Holland will make good in due time. On the whole, the industry will continue to afford a reasonable livelihood to

those engaged in it. The new uses for china clay are being so continually extended that no substitute either in matter of price or suitability has been, or is likely to be, discovered, and provided the ocean is kept free, the world will be able to get its supplies of Cornish clays with only the extra war insurance added. The Government measures for securing financial stability and for assisting marine insurance have been especially welcomed in the clay district, where on the one hand fairly long credit is given, and on the other practically all the production is exported. There has been a very good spirit of mutual helpfulness in the trade, and there is every reason to believe that employers and men will continue to gain a honourable livelihood.

The Shake

By B. Arnould.

The shake is the method by which the felting of the pulp fibres, effected by hand in the days before the paper machine was invented, is caused during the passage of the pulp over the Fourdrinier wire.

Hand-made paper is preferred to mould-made paper because the shake is given by the hand of the workman. The wielder of the hand mould is an artist, skilled of hand, and keen of eye, especially if he makes water-marked paper for banknotes and other papers of value.

The oscillating table of the paper machine shake is intended to imitate as far as possible, the movements given to the mould by the hand and wrist of the coucher. It is necessary to regulate the position of the fibres while they are draining, so as to accelerate or retard the separation of the water, and to give the sheet an uniform thickness and very nearly the same strength in every direction.

Many forms of apparatus for regulating the reciprocating movement of the shake, and they have been greatly improved of late years, without however succeeding in equalling the work of the hand. All reciprocating mechanism imparts to the table, which has considerable weight more or less violent shocks succeeding one another without interruption at the rate of 200 to 300 per minute. This is done by means of connecting rods, cranks, friction discs and other contrivances. The shakings are not rhythmic. For the most part they are abrupt shocks as the table is thrown first this way and then that without ceasing. The effect is greatly assisted by the reaction of the rest of the machine, which produces counter shocks as they resist the movement of the table.

The great difficulty has always been to get uniform strength of the web. With some cases it is difficult to get the transverse strength more than half the longitudinal strength. M. M. Thiry and Co., have invented a new reciprocating mechanism, which is said to shake without abrupt shocks. It is made on the principle of utilising the centrifugal force obtained by a revolving motion. In this way greater simplicity of construction is attained, and roll-axes and bearings are saved much wear and tear.

The apparatus is fixed at the end of the head of the machine, is in one piece with oscillating table, and can be adapted to a table supported like the hanging table.

Speaking of the hanging table, the writer wishes to say something about the difficulties he has encounter-

ed in making certain fine papers required of exceptional strength. It was on a modern machine with the table suspended from above, and provided with every improvement known at the time. The felting was different at the edges of the web, and the fault showed itself from right to left and vice versa, although the pulp was flowing on to the wire with perfect uniformity. The result of the difference in the felting was that the tensile strength of the web varied from 25 to 30 per cent from one edge to the other.

The writer arrived at the following explanation. In the first place, it seems that the hanging table should obey the law of gravity, which law should rather be an exception when it is a question of the construction of metallic masses of this importance.

To take advantage of the supposed advantages of the gravity of bodies acting as pendulums, to maintain the equilibrium of the to and fro movements of the table even transversely, and to lighten the effect of the constant action of the mechanism giving the reciprocal motion which has to overcome the inertia of the motion in the opposite direction, makers of machinery have been induced to re-establish automatically the displacement of the oscillating table from the direction of the web by means of springs for example. Without any change in the flow of pulp on to the wire, the least pressure exerted on one side on one of the springs, would reverse the functions (roles), and the lessening of the strength of the paper would be immediately transferred, entirely or partially, to the other edge of the web.

Guided by these practical and mathematical data given by the dynamometer, the writer thought he had to seek a point, and he sought for it in vain in the course of several makings of very strong papers which had to have a mean breaking length of 1,500 metres.

When after various attempts he arrived at satisfactory data, and at almost identical tensile strengths, he thought that the head of his machine was at last in order, but he was quite wrong. A change in the reciprocating motion, necessitated by differences in the length of the fibre or in the greasiness of the pulp, brought back the same old difficulties in the variations of strength from one edge of the web to the other.

Never, so far as he knows, has the writer had such trouble with tables supported from below, unless undue wear had caused the table to deviate from the horizontal. He infers that the suspension of the table from above is not an improvement, at least as regards the making of fine papers. He lays no particular stress on the increase in working expenses due to the hanging table, or on the wear and tear of bearings and axles, despite the employment of buffers, or on the wear of the wire due to shifting of the bearing rolls.

Progress does not consist in absolute rejection of an instrument with the idea that those who have hitherto used it were fools and without proper knowledge of their business. All experience is derived from the collation of the most varied labors by the association of ideas which is born of the knowledge of a very large number of practical facts.

This is why the writer applauded, personally, the patented invention above alluded to. This invention, inspired by practical experience, allows of the construction of a table both suspended and supported, to avoid the difficulties above mentioned of the table simply suspended.

The combination of the two principles permits of the construction which is strong, equilibrated in all its

movements according to the law of gravity, and according to the particular necessities of the manufacture of fine papers, for which the perfecting of the plant is so necessary? The principle appears to indicate a priori. *Le Papier*.

Ottawa Notes

Low water is the problem which is facing pulp and paper manufacturers in Ottawa district just at present. The demand for newsprint having proved the silver lining to the war cloud for the trade, manufacturers were beginning to take a cheerful view of things in general but the rapidly dropping level of the Ottawa river has placed matters in a different light. The pulp and saw mills of the J. R. Booth Company were closed down over a week ago owing to this cause and about a thousand employes were thrown out of work. Although half of these men have been taken on again it is problematical whether the remainder will be placed again this summer.

The Booth Company closed down its plant when the water became so low that to continue operating at full time would have affected the capacity of the city waterworks. Arrangements were made, however, for the operation of the two pulp mills from 12 o'clock at night until 6 o'clock in the morning. The paper mills are run by steam engines and are thus able to operate continuously. The company will probably have to purchase pulp from outside sources to furnish raw material for the paper mills. However, the rainy weather during the past week has improved the situation somewhat and it is hoped that if it continued it may even be possible to operate the pulp mills once again at full time and to reopen the saw mills. Other lumber and pulp and paper firms operating on the Ottawa have been more or less affected by the low water and scarcely any of them are operating at full capacity in spite of the demand and high prices paid for pulp and paper.

According to Mr. Jackson Booth, of the firm of that name, the outbreak of war has cut off the whole export trade of the company and no pulp or paper has been shipped anywhere since the situation first developed. The paper which is being manufactured outside the local and American demand is being placed in stock.

Mr. W. H. Rowley, general manager of the E. B. Eddy Company, says that from the outlook of things at present business with his firm will be continued as usual providing the necessary raw materials such as metals, clays, chemicals, colors, etc., many of which were imported from foreign countries, are still obtainable. However, prospects are that no serious inconvenience will be caused and consequently the staff now employed is not likely to be reduced.

Pulp and Paper Possibilities.

The possibilities for Canadian pulp and paper manufacturers that are presented by the present war situation are being made the object of exhortations to the trade by the Trade and Commerce Department. Sir George E. Foster, Minister of Trade and Commerce, last week issued an appeal to Canadian manufacturers to win a bloodless but effective victory by availing themselves of the advantages of present con-

ditions and capturing the markets hitherto held by Germany.

In the pulp and paper field Sir George Foster's remarks are pertinent. He states that "Germany is a great paper exporting country, her shipments to Canada last year amounting to \$350,187. Now that Germany can no longer ship paper overseas the Canadian paper industry should be in a position to supply a large part of the above amount. Packages and parcels were also during the same year purchased from Germany to the value of \$160,659." A statistical presentation of Germany's exports of pulp and paper to Canada show that in 1914 she sent the following: \$7,987; ruled, bordered, coated and boxed papers and papeteries, \$23,678; wrapping paper \$17,341; other paper, \$269,326. In 1914 paper to the value of \$25,228 was also imported from Austria-Hungary.

On the other hand the United States, through the anxiety of her own paper manufacturers to capture the German trade, will present a splendid market for Canadian pulp, both groundwood and sulphite. A large number of the United States mills have depended entirely for their supply of the raw material on Canadian and European sources. With the latter cut off they will have to depend on Canada. It has been estimated that at least a hundred mills depend wholly on European pulp and as the supply in the United States is already taxed to the utmost, these will now have to look toward Canada for the product or close down. All this means a harvest for Canadian manufacturers.

Forest Protective Association.

The splendid work which has already been accomplished by the Lower Ottawa Forest Protective Association and the growth of the idea as shown by the number of new members who have joined is evidenced in a statement presented as to the progress of the Association. The area of timber limits protected has grown from about 9,000 square miles to 11,812 or 7,500,000 acres. Forty-nine permanent rangers under a manager and four inspectors are permanently employed and these in turn employ temporary help when needed. Forty convictions of settlers for starting fires without a permit have been secured, and it is expected this class of timber fires will be more rare from now on. It is expected that the results already secured by the recently organized Lower Ottawa Association and which have for some time crowned the work of the premier organization, that in St. Maurice Valley, will be followed by the establishment of similar associations in other parts of Eastern Canada.

Fraser Lumber Co. Will Not Remove.

The Fraser Lumber Company, which operates extensive lumber mills at Deschenes, near Ottawa, and possesses large limits of saw timber and pulpwood, will not remove its mills to the Hurricanaw district, as was announced some time ago. Officials of the company state the plant will not be moved from this district in the next five years. It is learned, however, that Mr. F. A. Gendron, M.L.A., who is associated with the Fraser Company in their recent acquisition of valuable timber and pulpwood berths in the Hurricanaw district, is now erecting a large sawmill on the limits which has done away with the necessity for the transfer of the Deschenes plant.

Notes.

The action of the legislature of Newfoundland in passing an act allowing the export of pulpwood un-

manufactured from Newfoundland and Labrador, hitherto prohibited, will somewhat relieve the situation, it is expected.

Of some interest in the present situation is an official statement of the trend of prices in Canada at present issued by the Labor Department for the information of the public. After pointing out that the cost of living in the Dominion has not gone up greatly as a result of the war, it states in regard to paper that news print is higher on account of the demand and that caustic soda and some other chemicals used in paper manufacture are also higher in price.

A number of shantymen and workers in the pulp and paper mills around Ottawa have caught the war spirit and enlisted. Three citizens of Hull, who are employed in the pulp mills of the E. B. Eddy Company are among this number and the Eddy firm, as is the case with most of the others in this district, has announced that their places will be kept open for them and their families assisted throughout the war. Some of the shantymen who have applied for enlistment stated they had only heard of the war a week or two ago, and had immediately left to become recruits.—MAC.

EUROPEAN WAR PRICES IN GREAT BRITAIN

Shipments of Pulps Reduced and Paper Prices Advanced.

(From Our London Representative.)

When questioned as to possibility of the threatened "world's famine" in paper, a well-known pulp and paper man in London said, "The 'famine' may apply to America (thanks to her tariffs), but you know as well as I do there are no complaints to be made. We have the paper stocks, and thanks to the British fleet, we can get the pulp from Scandinavia and Canada, with the ready money in our hands. That is British policy in war-time."

Now, I am of the opinion these few remarks about sum up the present position of the pulp and paper trades. New business in pulps is in most cases paid for on spot and millowners say their position in the paper industry is not so bad as was first anticipated, though there might be a few exceptional cases, particularly in Scotland.

Paper Prices Advancing.

Amongst the Scottish paper manufacturers, who are interested in esparto, some difficulty is experienced in obtaining supplies of the raw material, and Messrs Ide and Christie, the well-known fibre importers, and Messrs. Morris, report that business is practically at a standstill and much anxiety is felt as to shipments from the foreign ports against contracts. These shipments have considerably reduced since the European war broke out, and consequently there is great anxiety on the part of the Scottish papermakers to meet the wants of their numerous customers. They are, therefore, trusting to their stocks holding out, and a supply of esparto in the near future to meet their obligations.

In other classes of papers the demand is good. Old stocks are being sorted out and a kind of stocktaking is in progress. I saw one newspaper office bring out close on 300 tons of newsprint that it had stored away in one of the most fashionable and business parts of London. The paper had a damp smell when turned over in the dark store, but otherwise it presented a fair appearance, and was quite suitable for the busy newspaper office where thousands of copies are turned out in the half hour. People in England have not the time to consider the quality of paper now—they want to know how the events are going on the Continent, and what the banks are doing. Paper is a secondary consideration, though we are running our business on it, instead of the proverbial sovereign or gold half sovereign. But if a census of the

production and consumption was demanded to-day, I believe we could get it with great accuracy. In America, I notice, a census of production of papers in Great Britain can easily be produced for publication; but it is a remarkable fact that no correct census of production or of consumption can ever be obtained in London. The London paper men does not live in a fool's paradise, from what I can learn of him. Because there is a European war raging over his head he has not rushed up prices of his papers. He is going steadily on with his work, attending to his contracts and his customers, who, as time goes on, are gradually acquainted that prices must inevitably rise to a higher basis. By this means the British paper manufacturer, without surprising the market, is gradually achieving his object, and the Trade Board is dealing with the foreign competitors.

There is war with arms, and now there is war in trade, but not so openly as it is done with firearms. So that the British paper manufacturer is getting over the check he received when the war first broke out, and how long he may continue in his present sphere it is difficult to say. Newsprint is going at 4 cents, in some cases at 3 cents per pound. The German, Austrian and Swedish papers of all classes, kraft, etc., are receiving a severe shock and the British newsprint mills are busy. It is true that about 50 newspapers and publications have ceased to exist during the war, but this factor only stimulates the feeling for the British and Canadian products, and the British and Canadian mills. Therefore, if there is any surplus paper in Canada, London is the place for them, with a fair price tacked on. Newfoundland is already busy in connection with the London trade and there is no reason why Canada should not be.

Unfortunately the vessels trading between Norway and one or two other Scandinavian ports are meeting with the German mines on the sea routes. One of the London evening papers lost 200 reels the other day in one of these sunken vessels, and another steamer went to the bottom with about 150 tons of paper—all newsprint, which is peculiarly valuable at this critical period. The British Admiralty now say that voyage may be undertaken except to Holland, Denmark, Germany and Sweden, the Russian Baltic ports and Adriatic ports. There is also a risk in entering the London port and the east coast of England ports

at night. In this great crisis the government is naturally working at full pressure. They keep printers at their posts night and day, which is good for the paper mills, and they are also making big demands on the paper manufacturers and their agents.

No Market For Pulps.

There is no market for pulps. That is the position of affairs. Here are some of the quotations of the last day of August:—

Sulphite Bleached (No. 1)	\$72.00	to	\$87.00
Easy Bleaching (No. 1)	25.00	to	26.00
Sulphite news	48.00	to	48.50
Ground Wood, moist	14.40	to	14.80
Ground Wood, dry	24.00	to	26.00

For all new business cash must be paid against documents. The pulp men in Manchester, like those in London, are wondering what will next happen. In fact, I heard of one the other day who could not even cash his new one pound notes issued by the government in order to obtain the coin of the realm to pay his office staff. If this is the case with pound notes, what will business be like in the pulp trade? However, as a man said to me the other day, there is pulp for everybody if we pay for it. It will be borne in mind that the shipments of pulp to England were very fair before the war broke out. Since the war, the London Custom authorities have informed me that the following were the imports:—

First Week of War.

	Tons.
Bleached chemical (dry)	555
Unbleached chemical (dry)	6,084
Chemical (wet)	10
Mechanical, moist	9,034

Of the mechanical, 3,910 tons came from Canada. All the other pulps came from Sweden, Norway, Denmark and a little lying on board ships from Germany and Austria.

Second Week of War.

The second week of the war, which was after panic week had passed away, the arrivals of pulps were:—

	Tons.
Chemical (dry)	60
Unbleached chemical (dry)	2,925
Mechanical, moist	837

All arrivals from Sweden, Norway and Portugal. The arrivals following were for the

Third Week of War.

	Tons.
Bleached chemical (dry)	80
Unbleached chemical (dry)	994
Mechanical, moist	10,993

Of the mechanical, 6,327 tons came from Newfoundland and 3,866 tons from Canada. So gauging the position during the first three weeks of the war, the state of things is not so bad as was first expected.

Chemicals.

Chemicals, of course, are dearer and so are fillings and loadings. Canadian papermakers are enquiring about makers of caustic soda and other chemicals, in addition to clays in England. All they have to do is consult the Pulp and Paper Magazine for the information or address the enquiry to me through the editor of the Pulp and Paper Magazine. Bleaching powder or caustic soda is falling and rising so rapidly that it is difficult to give a quotation. The same may be said of most chemicals. There is no shortage—in fact, the cutting off with Germany has given stocks an impetus.

Canadian Pulp Possibilities in China

Dr. J. W. Ross, Canadian Trade Commissioner at Shanghai, China, has made an interesting brief report on Chinese pulp and paper conditions. He says that the importation of wood pulp into China is not a large business, nor does the demand seem to be increasing. The importations for 1913 were considerably in excess of those for 1912, but then again they were less than the total of those for 1911, so the consumption of wood pulp for the three years 1911-12-13 one with another average practically the same figures.

For the three years considered, China imported wood pulp to the amount of:—

	Tons.	Valued at.
1911	2,800	\$84,595
1912	1,526	47,303
1913	2,442	72,139

The Chinese are said to have been the first people to manufacture paper, and so for many hundreds of years and through thousands of generations, the business has been carried on until the manufacturers, although working under the most primitive of methods, have been able to bring their products to wonderful perfection. Thus it is that it is only in the manufacture of paper for foreign newspapers and for books printed in foreign languages that foreign made paper is employed, and much of this imported from other countries.

Of the total amount of wood pulp annually imported, about half is Scandinavian pulp. The prime reason for this is that the agents for the principal foreign paper mill in China is a Danish firm with important commercial connections in Denmark, Norway and Sweden, so the bulk of their orders go to that part of the world. Germany has also during the past five years supplied a fair proportion of the amount imported. While Canada in 1912 sent only about 1,200 lbs.

The agents for the Paper Mill Company above mentioned placed an order last month for Scandinavian pulp as follows:—

450 tons mechanical at £5 10s per ton C.I.F., and 200 tons strong sulphite at £7 7s.

This company import about 800 tons of pulp per annum.

The above figures show that a fair amount of wood pulp comes annually into this country, and the amount may possibly increase. It would, therefore, be well for Canadian manufacturers to supply the Canadian Trade Commissioner with samples and prices of their products to enable the latter to introduce the article should occasion arise.

BATHURST PULP MILL EQUIPMENT.

The Bathurst Lumber Company has been letting some contracts for equipment for their pulp mill. What will be the largest board machine in Canada, 136 inches wide, with 77 driers, will be supplied by the Black and Clawson Co. The same firm will supply also sulphite drying machine of 31 driers, 100 inches wide. The boilers for the plant will come from Scotland, to be supplied by the Babcock and Wilson Co. The steam turbines and generators will be furnished by the Westinghouse Co. The barking drums will come from Wm. Hamilton and Co., Peterborough, Ont., and the digesters from the Portland Co., Portland, Me. The Watsons Engine Works will make the stacker, slasher, log jacks and flat screens. Boving and Company of Canada have received the order for the chipper, rechipper and chip screens.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The New York Consolidated Card Co., now located on West 14th Street, New York City, are in the throes of moving. Their handsome new building at the corner of 4th and Webster Avenue, Long Island City, has been completed, and the firm expects to be completely moved there within the next two weeks.

* * *

The St. Regis Paper Company of Watertown, N.Y., has been made defendant in an action brought by Toney Spirka, a former employe of the company, in the amount of \$10,000 for damages on account of injuries received last May at the defendant's mill at Deferiets. The plaintiff alleges that on May 29, while he was engaged in repairing, taking out or turning over a part of a paper machine, a blanket felt or screen, the machine was started and his left arm was drawn into the machine, broken above the elbow and otherwise badly bruised. He charges that he was provided an unsafe place to work and that the machine was started up under the direction of someone in charge.

* * *

The plant of the Aldrich Paper Co., at Natural Dam, N.Y., is once again in operation after having been shut down for a period of five weeks for repairs. Two new water wheels have been installed in the pulp grinding department, and the old machinery has been overhauled and repaired. The sulphite department reopened last week. The company has an unusually large number of orders on hand, and it is expected that a very busy winter in the newsprint line is assured.

* * *

Superintendent O. F. Dodge of the Taggart Paper Company mill at Great Bend, N.Y., while down in the beater room wheel pit, one afternoon several weeks ago found a watch which he lost about 12 years ago. Every time when the mill has been down for repairs, and when he would be down in the wheel pit he would think of his watch and would make a search for it, but without success. Thursday, however, while in the pit and not thinking of the watch, he placed his hand on a ledge of rock and right on the watch. The cases were a little darkened, and nearly all the works had rusted away.

* * *

Upper Mill No. 2, known as the "brick mill" of the Onondaga Paper Company, on Nine-Mile Creek, between Marcellus Falls and the village of Marcellus, N.Y., was badly damaged by fire at 2 o'clock one afternoon last week. The entire south end of the building, in which were the unfinished stock and beater rooms, and the boiler room, was burned, and the contents, with the exception of the machinery in the boiler room, was practically destroyed. The roof of the boiler room was burned off and the room flooded.

* * *

A fire of unknown origin started in the stock shed of the Tonawanda Board and Paper Company at Tonawanda, N.Y., last week and was fought by the fireman for several hours. L. C. Newman, president of the company, said that the amount of damage could

not be ascertained at this time, as it would be impossible to get at the stock until it dries out some. The stock was flooded by the large amount of water turned on it. Mr. Newman said that he thought the fire started from some persons smoking in the place. The structure and contents were insured.

* * *

Remarkable progress is being made in cleaning up the wreckage at the plant of the Eddy Paper Co. at White Pigeon which was recently partly blown down during a storm. It is the desire of officials of the company to rush this work just as fast as possible, and plans are now being considered which will permit the early operation of the mill. It is probable that a temporary wall will be erected and only a temporary roof put over the machine room so that the paper machine can be placed in operation at the plant. The men now engaged in doing the repair work are the regular employees of the mill. The damage, it would be a week ago, going nearly to \$75,000.

* * *

The new and complete list of officers of the reorganized Brunet Falls Manufacturing Company of Cornell, Wis., now known as the Cornell Wood Products Company, was announced last week as follows: C. O. Frisbie, president and general manager; O. M. Gordon, treasurer; W. G. Saville, secretary and sale manager; E. W. Cowell, assistant sales manager; superintendent, Duncan L. Leslie; assistant superintendent, Ernest Beyers. The plant is again in full operation. Sales offices have been opened in Chicago.

* * *

The Interstate Commerce Commission has dismissed the complaint of the Rhinelander Paper Company against the Minneapolis, St. Paul and S. S. Marie Railway Company, adhering to the conclusion of the original decision. The traffic involved in the complaint was that of the transportation of pulp wood from named points in Michigan to Rhinelander. The reductions asked for were as follows: From Trellanary from 6c to 3.65c.; Delta Junction, 6c to 3.80c; Manistique, 6c to 3.80c; Whitedale, 7.5c to 3.80c; Bovee, Christiansen Spur and Spur No. 447, each, from 7.5c to 4.10c. These rates were the ones in effect from Minnesota points to the same destination, and were similar to the rates established by the Wisconsin Commission.

* * *

Warrants are out and several detective agencies have been engaged to look up Carl H. Baker, confidential clerk of the Great Northern Paper Co., at Boston, Mass., charged with the forgery of a check for \$3,260 and said to be short in his accounts about \$7,000 besides. About a month ago he asked for a two week vacation, which was granted. When he did not return when expected, his books were examined, and it is said many false entries and shortages were discovered, also that he had forged a check for \$3,260, made payable to F. A. Gilbert, of Bangor, superintendent of the spruce wood department of the company, which Baker cashed at a Boston bank, without question, as he had been in the habit of handling cash for the office.

At the same time Baker left town a young woman employed in a photograph studio, to whom he had been paying attention, also disappeared.

Baker has lived all his life in Brewer, where he graduated from the Brewer High School and a business college. He had been employed by the Great Northern Company for some time and considered a capable employee.

* * *

The Continental Bag and Paper Company in Watertown, N.Y., has about completed the addition to its mill in Water Street, and the machinery is already being installed. The new building is of three stories, and a basement, and is constructed of brick. H. J. Wright is the contractor for the building, and it cost about \$20,000. Heretofore the local paper company, which is engaged in the manufacture of tissue paper, has shipped the manufactured article to Boston and other cities to be cut and packed for the retail trade. In the new building will be placed machinery for doing this latter work and the finished article will now be prepared in Watertown. It will doubtless furnish work for more men than formerly.

* * *

A force of men is now engaged getting the paper machines in the Allen plant of the Union Bag and Paper Company's mills at Hudson Falls, N.Y., ready for operation. When the machines were closed down a number of months ago, the felts, wire, etc., were removed. It is believed that three of the five machines will be ready for operation this week. Superintendent Fox states that the former employees of the company will be given their old jobs back if they desire to return. The resumption of the Allen plant will mean employment for about fifty men.

* * *

The Martin Pulp and Paper Company of Norfolk, N.Y., has filed in the United States Court at Utica a petition in voluntary bankruptcy and Orrin E. Martin, of Norwood, N.Y., has been appointed receiver with authority to conduct the operations of the mill until such time as his services are no longer required. Among the creditors filing the petitions were the Citizens' National Bank of Potsdam, a creditor for \$13,000, the People's Bank of Potsdam, for \$1,000, and the Racquette River Paper Company of Potsdam, for \$4,000, all secured. According to the Creditors' petition, the pulp and paper business conducted by the corporations is fairly remunerative because of the present market conditions. In appointing the receiver, Judge Ray gave authority for the operation of the plant until a further order of the court or further action may be taken by the creditors, unless the bankruptcy proceedings are settled. While the above-mentioned creditors hold a total amount against the paper company for upwards of \$18,000, they are all secured by first mortgage bonds of the company, notes and other security. They charge as the act of bankruptcy that on July 23 last the company permitted a Utica bank to secure a preference for \$1,652 under a court order.

There is also an expression of alarm in some quarters in this large paper manufacturing center as to just what will be the outcome of the advanced cost of production. While the prices are soaring upward, and the price of materials is also following upward, there are very many of the local concerns who will not be in a position to immediately take advantage of the higher market on account of long period contracts. It is believed by some that the present

situation is going to work a hardship in this respect.

It is alleged in the petition for the appointment of the receiver that the assets of the company include a rights and mill equipments valued at \$2,500. There is machinery of the value of \$45,000; belting, supplies, etc., \$50; pulp wood in cars, \$700. There is no estimate of the liabilities of the company. The mill has been in operation for the last two years and there is a quantity of raw materials now on hand which it is claimed could be marketed profitably because of the condition of the paper and pulp market. It is also urged that it is for the interests of all the creditors that the property of the company should be kept on a live basis, and that the plan should not be closed down.

While there was nothing in the papers filed against the company showing that a reorganization of the company will follow, it is believed that this course will be taken.

* * *

The sales of the Canadian timber lands and the rossing mill of the bankrupt Battle Island Paper Co., will be held up for several weeks or months' longer, although all but one or two of the creditors interested voted the price of \$300,000, offered by the Ontario Paper Co. of Thorold, Ont., to be satisfactory. This statement was made by William P. Gannon, attorney for the trustee of the Battle Island Co., who has just returned to Watertown, N.Y., from Quebec, where meetings of creditors and of the liquidators have been held.

"With one or two exceptions," Mr. Gannon said, "the creditors believed that the \$300,000 offered by the Ontario Paper Co. in Syracuse, recently was satisfactory. Certain creditors, however, raised objections to the legality of the meeting held at Chicoutimi a week ago and other objected to the proposed methods of distributing the proceeds of the sale among the creditors.

All of these questions will have to be argued before the Superior Court of the Dominion of Canada at some time not yet agreed upon, but which it is expected will be within a few weeks. We will be given notice and will appear at the argument.

The objections raised by the creditors who took a stand apart from the others were of a general nature and contained no detailed statements. When the matter comes up for argument they will be compelled to file specific statements showing on what their contentions are based.

It is probable that the objections relating to the legality of the meeting will be brushed aside and that plans will be made to carry out the terms of the sale. More than \$1,000,000 was represented in the voting at the meeting last week. The meeting was one of both United States and Canadian creditors. As soon as the Canadian situation is cleared up an application will be made to Judge Ray for an order to dispose of the sulphite plant of the Battle Island Co. at Fulton, the water rights, etc."

* * *

The reduction of the tariff as far as the paper mills are concerned does not mean in all cases that the mills receive the entire benefit of the reduction. "The wood pulp used by the Holyoke, Mass., mills, of which a large amount is imported, had a tariff reduction of one-fourth of a cent per pound," said a prominent manufacturer of that city last week, "but of this reduction the paper mills lost a fraction, as the price was raised by the importer to cover a fraction of

the drop. It is also understood that in some other paper mill supplies where there was a drop in the tariff that the price was raised across the water to practically take up all the profit of the drop, so that the local mills did not get the material much cheaper than under the higher tariff. It is probable that this ought to make the lowering of the tariff popular across the water. However, if the local mills can get the raw material with which to work at the present time they ought to be able to get back at some of the European countries, where paper has taken a great advance, by boosting up the price of paper exported from this side, and with a paper shortage across the water already reported the paper manufacturer here should find a ready sale."

Wood Pulp Industry in Sweden

The United States Consul at Goteborg, Sweden notes that the value of the wood pulp produced in Sweden increased from \$938,000 in 1886 to \$30,000,000 in 1912. In 1912 there was produced in the country 1,556,499 metric tons of pulp, of which 41 per cent was dry chemical, 23 per cent moist chemical, 32 per cent moist chemical, and 4 per cent dry mechanical. Last year there were exported 1,007,457 metric tons of pulp from Sweden, of which 177,677 tons were from Goteborg. The wood pulp invoiced for export from Goteborg to the United States in 1913 was valued at \$2,083,141, or \$93,610 less than for 1912. Almost all of the pulp shipped from this port to the United States is the dry chemical product.

Prices of wood pulp fluctuated considerably during the year. The level of prices was rather high at the beginning of the year, but declined toward the close of the year. The price of strong chemical pulp was between \$38.86 and \$39.93 per metric ton at the beginning of the year, declining later as low as \$34.84 but rising again to \$37.52. Easy-bleached chemical pulp sold for \$42.88 per metric ton, but fell later as low as \$37.52. Bleached chemical pulp sold for \$53.60 per metric ton. Comparatively little of the latter pulp is produced in Sweden. Sulphite pulp, easy bleached and strong, seemed to be most in demand.

Prices of mechanical pulp were low, but increased somewhat in the autumn. Prices of moist mechanical pulp varied between \$7.50 and \$8.58 per metric ton.

The paper industry has advanced considerably during the last thirty years. In 1912 there were produced 278,984 metric tons of paper valued at \$15,706,190, and 38,554 metric tons of cardboard, pasteboard, etc., valued at \$1,483,149. Over one-half of the paper produced was cartridge, packing, and other heavy paper, and over 46 per cent was writing, document, printing, and other paper not gilt, silvered, or glazed. The production of high-grade paper is therefore comparatively small.

The exports of paper and pasteboard from Sweden in 1913 amounted to 211,569 tons, of which 150,283 tons passed through the port of Goteborg. About 85 per cent of the exports consists of heavy packing, wrapping, and printing paper.

The imports of paper and pasteboard into Sweden consist mainly of high-grade writing paper, parchment paper, colored paper, and certain special grades of paper board.

Kraft Outlook Bright

Since the outbreak of the war the price of extra strong kraft pulp has been advanced from \$37 to \$47 per ton delivered, and the Dryden Timber and Power Co., Limited, Dryden, Ont., of which J. B. Beveridge is General Manager, is very busy. The company report that their coal and chemical supplies are drawn entirely from Canada and that their manufacturing conditions will not be effected in any way. They have withdrawn all quotations and expect that, if hostilities keep up, the price will be increased by several dollars in the near future. Reviewing the present situation and outlook, Mr. Beveridge said: "In my opinion, the supply of chemical pulps cannot satisfy the demand for same in the United States, until the present war is ended, and the present prices we are receiving for our product will be maintained, if not increased, over the year 1915, for the following reasons: "The German and Austrian production of sulphite pulps is entirely stopped. The Scandinavian chemical pulp mills purchase a portion of their pulpwood supply from Finland, also they buy a portion of their chemicals and coal from Germany, the production of which is almost, if not entirely stopped. The Scandinavian countries, Norway and Sweden, have partly mobilized, which will result in the partial crippling of their industries owing to the scarcity of labor.

"Even although Scandinavian mills are able to operate, it will be with a restricted output, and therefore an increased cost. Also after having manufactured their product, it is doubtful if the Scandinavian Mills will be able to make shipments to America for many months, owing to the difficulties of ocean transportation; in any case, they will have to pay very largely increased freight, insurance and exchange rates, before they can sell their product to American mills. This, of course, will maintain, and perhaps increase, present prices.

"As the production of American and Canadian chemical pulp mills is only a small proportion of the total consumption, I am of the opinion that they will in future be able to secure a more equitable return on their investments, which they have not been able to do in the past, owing to the competition of the European mills, with their over-production and lower cost of labor, chemicals, etc."

CANADIAN WALL PAPER IN GREAT BRITAIN.

Mr. Claude Dyer, Acting Trade Commissioner at Leeds, observes that it is interesting to note from the annual returns for last year that a small quantity of wall paper was shipped from Canada to this country. Local merchants who have visited Canada give Canadian manufacturers credit for the artistic and novel designs of the paper-hangings they produce. It is considered that in the cheaper varieties of paper there is but little opportunity for trade here owing to the high producing capacity of English mills, but in regard to the more expensive grades, however, it may be stated that regular supplies are imported from abroad.

Collett-Sproule, Limited, paper box manufacturers, 786 King Street West, Toronto, have removed to their new and well appointed factory on Portland Street, above Adelaide, which will greatly increase their capacity.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE



Messrs Y. Trotter and Son, Ltd., of the Chirside Bridge Paper Mill, in Berwickshire, have presented their 27th annual report, which shows that, including the sum £3,654 19s 5d brought forward from last year, less £300 voted at the last annual meeting for directors' fees, there is a balance at the credit of profit and loss account of £7,916 15s 4d. The directors say that in a normal state of affairs, they would have recommended the immediate payment of year's preference dividend, but a view of the great national crisis, they think it prudent that the actual payment of the dividend should be deferred to a date to be fixed by the directors in their discretion. The directors, therefore, recommend that the balance of profit, £7,916 15s 4d, be dealt with as follows:—To write off for depreciation £2,000; to pay as above a year's dividend of 5 per cent per annum on the 7,213 preference shares of £' each, £1,803 5s, less income tax, £105 3s 10d, leaving a balance of £4,218 14s 2d to be carried forward, subject to directors' fees.

* * *

The war has caused Messrs. F. Beckers and Co., Ltd., the London agents for the Chicoutimi Pulp Co., and the MacLeod Pulp Co., of Liverpool, to give Canada some attention for pulp, in common with other agents. Messrs. Beckers' Canadian-American branch is at present very busy dealing with orders and shipments. Two steamers are on their way to England with ground wood.

* * *

It is reported in London that some of the mills in north Sweden are in a bad way owing to the want of coal and water, in addition to sulphur. A general stoppage is expected. In Norway there is also a scarcity of coal, but every effort is being made to resume the shipments of fuel to Christiania. Mechanical pulp in Christiania is quoted at kroner 43 to 45, easy bleaching kroner 170 to 180. The prices of sulphite pulps have risen from kroner 30 to 40.

* * *

The Trade Board in London are busily engaged with the paper mill owners in working up statistics and particulars as to markets supplied by the Continental countries at war. Their sole object is to capture the German and Austrian markets in foreign and colonial possessions, and this is partly to be dealt with by means of tariffs. In all markets where British mill owners enjoy a preference tariff, Canadians should see that they get the same as their British friends. This will be done if application is made channel in the Dominion and, if possible, the Paper and Pulp Association should be asked to back up the application. Now is the time to move!

* * *

Pulp producers in Sweden report that owing to the mobilization of the army, the mills have been deprived of numerous employees. The production of pulp is therefore limited, and stocks at present are not very large. Enquiries on a large scale are being

made by people in England and the United States and prices have advanced all round. Shortage of water and the question of the supply of coal in the near future, are two outstanding factors that are causing considerable uneasiness in the mills.

* * *

The war in Europe has disorganized the china clay industry in England, but it is gradually recovering. The American demand is active and numerous enquiries are also being made from Canadian sources. The great difficulty experienced by exporters of china clay and paper in England is the slowness on the railways which are at present in the hands of the government for military purposes.

* * *

The large imports of paper from Germany into the United Kingdom will now be entirely checked. Apparently the trade for some time past has been profitable. According to the British Consul at Leipzig over-production has brought the German cellulose paper factories into a very unhealthy state. Cellulose was originally supplied by certain firms to the paper factories, who only made their own cellulose in exceptional cases. In more recent times, however, the cellulose manufacturers decided to try to increase their profits by erecting their own paper mills. The result is seen in the fact that only three of the thirteen factories in Germany producing solely cellulose paper are paying—or were paying—dividends. Those paper factories which were run independently of a cellulose factory use comparatively smaller quantities of cellulose than formerly and they evince no desire to purchase cellulose from those factories which have become their greatest competitors, a fact which, of course, reacts unfavorably on the latter. Germans will now cease to get wood from Russia, and the prospects of the Teutonic mills are not very rosy when peace is declared.

* * *

The Prince of Wales, National Relief Fund in London to alleviate the poor and distressed during the war has been enriched by \$48,000 from the Kellner-Partington Paper Pulp Co.

* * *

Swedish exports of paper in June fell to 12,929 tons, compared with 15,513 tons in June, 1913.

* * *

Sir John Brunner, head of Brunner Mond and Co., papermakers' chemical suppliers, says in regard to the war: "The fact of the matter is trade will be thrust upon us." He admits we cannot touch Germany in the production of dyes.

TIMBER LIMITS PURCHASED.

The timber limits at Ha Ha Bay on the Saguenay River, formerly owned by the Battle Island Pulp Co. of Fulton, N.Y., have been purchased by the Ontario Paper Co., of Thorold, Ont., the figure being around three hundred thousand dollars. It is understood that twenty-seven thousand acres are freehold and one hundred thousand acres are leasehold land.

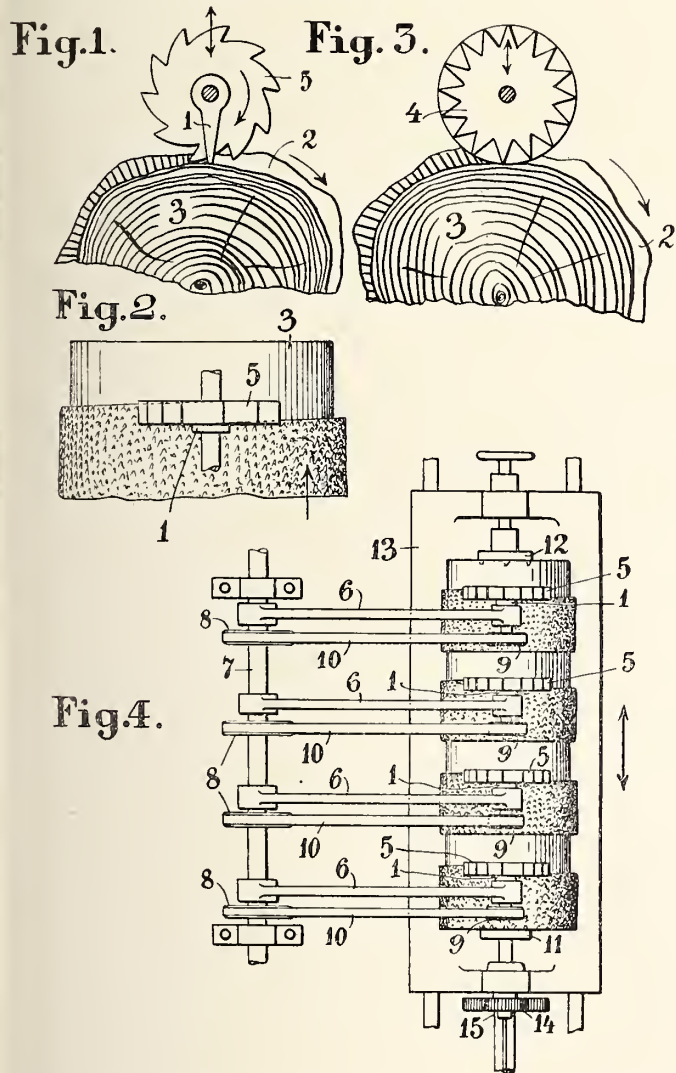
NEW PATENTS

PEELING MACHINE FOR WOOD LOGS.

Anders Nicolay Andersen, of Hongsund, Norway,
Patentee.

Patented Aug. 4, 1914, in United States Patent Office.
1,106,177.

In describing his invention, the inventor says:—My invention relates to improvements in log peeling machines of that class wherein a rotating cutter is used for peeling the bark from the log.



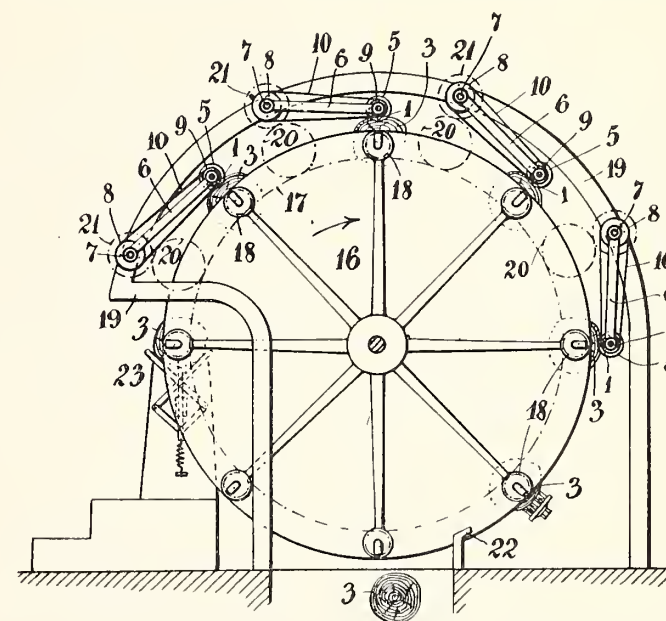
able of cutting the wood, out of contact with the latter.

In order that the invention may be clearly understood I will describe the preferred forms with reference to the accompanying drawings, wherein—

Figure 1 is a diagrammatic sectional elevation of one form of cutting device. Figure 2 is a plan view thereof. Figure 3 is an elevation of a modified form of cutter. Figure 4 is a plan view of a rossing or peeling machine embodying the invention. Figure 5 is an elevation of another form of machine.

The cutter, as indicated by the arrows in Fig. 1, is movable up and down, and comprises a non-rotatable knife 1, which is only capable of penetrating the bark 2, so as to determine the depth of cut of the cutter 5, which is rotated in a direction opposite to that of the log 3, as indicated by the arrows.

A serrated disk 4, shown in Fig 3 may be substituted for the knife, and as the teeth of the disk are incapable



of penetrating the hard wood, the rotating cutter cannot cut below the bark.

The object of the invention is to provide a peeling machine which will only remove the bark so that no wood is wasted.

The invention consists in providing a plurality of cutters comprising thin rotatable disks which are movable independently of each other and radially to the log so as to remove all the bark even when the latter is of different thickness on different parts of the log.

Each cutter is provided with a knife which is capable of cutting only through the bark which is softer than the wood, thus keeping the cutter, which is cap-

In the embodiment shown in Fig. 4 of the machine journaled in the free ends of arms 6 which are pivoted on a shaft 7, said cutters being pressed against the log 3 by their own weight and that of the arms 6 or by the action of springs, not shown. The shaft 7, is rotated by any suitable driving means, the rotation of the shaft being transmitted to the cutters 5 by pulleys 8 on the shaft 7 and pulleys 9 on the spindles connected by drive belts 10. The log 3 is fixed between chucks 11, 12, mounted on a movable slide 13 and rotated by means of a slidable gearing 14 driven from a shaft 15. The slide 13 is moved in the usual manner by a spindle, not shown, a screw motion being thus imparted to the log, which motion is so proportioned to the breadth of the cutters 5 that during one revolution, the log is fed a distance equal to the breadth of a cutter.

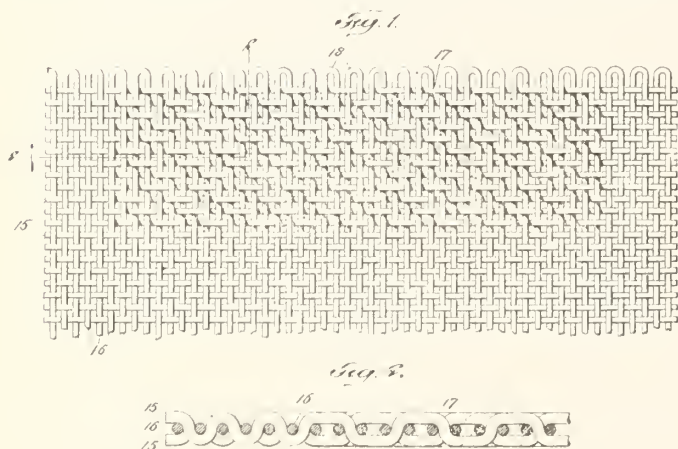
In the embodiment shown in Fig. 5 the logs 3 are secured by means of chucks and the like, on the circumference of a rotating wheel 16, and rotated by gearings 17, 18. The shaft 7, arms 6, cutters 5, knives 1, and driving devices 8, 9, 10, the same as those previously described and shown in Fig. 4, are mounted on a fixed frame 19 and operated through gearing 20, 21 indicated in dotted lines. The successive cutters 5 are spaced apart laterally the breadth of a cutter, the machine being so constructed that the log will be completely peeled of its bark by the combined action of all the cutters.

The machine may in a known manner be provided with an automatic ejector 22 and an automatic device 23 for placing the logs in position in the machine.

WIRE CLOTH FOR USE ON PAPER-MAKING MACHINES.

Charles A. Coups, Belleville, New Jersey, Patentee.
Patented July 21, 1911 in United States Patent Office.

The invention consists in a new wire-cloth for paper-making machines having the usual weave throughout its main body portion and at its opposite longitudinal side portions a twill weave of suitable width, say about one inch wide, the warp and weft wires throughout the cloth preferably being of the same diameter and character and the cloth thus formed being very durable and lasting and dispensing with the necessity of employing strengthening wires or cotton or silk threads and the like of the kind heretofore proposed for



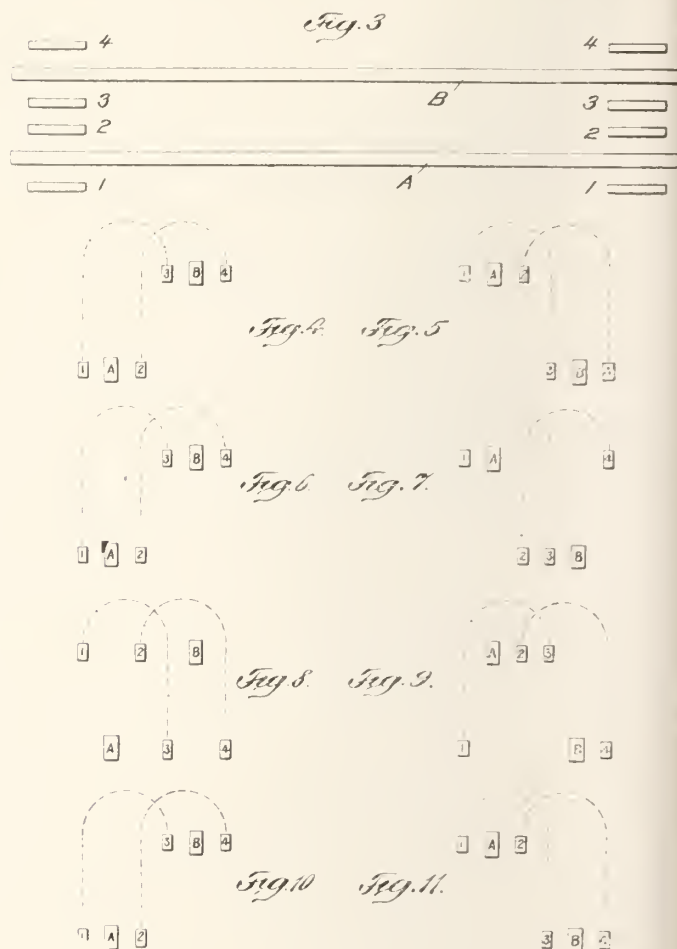
strengthening the edges of Fourdrinier wire-cloth.

In producing the wire cloth of my invention I employ a loom having the usual or main front and rear heddles common to this art and equip the loom with eight supplemental short heddles, four being adjacent to each end of said usual or main heddles and, at each side of the loom, two thereof being between the end portions of said main heddles, one in front of the end portion of the front heddle and one in rear of the end portion of the rear heddle. The two main heddles perform this usual functions in the production of the plain weave, and the eight supplemental short heddles are utilized in the production of the strip or band of twill weave along each longitudinal side of the width of the plain weave.

In the practical production of the wire-cloth the length thereof has the plain weave extending entirely across its width at each end for a limited extent, so as to enable the ends to be suitably joined together in the customary manner, while between said end portions of plain weaving the cloth throughout its length has at each side portion a suitable width or continuous strip or band of the twill weaving.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is an elevation, on an enlarged scale, of one longitudinal side portion of a length of wire-cloth embodying my invention, both longitudinal side portions of the length of cloth being identical in every respect; Fig. 2 is a section of the same on the dotted line 2-2 of Fig. 1; Fig. 3 is a diagrammatic top view of the usual two main heddles of a wire-cloth weaving loom and the eight supplemental heddles with which I equip



the loom, four of the supplemental heddles being adjacent to the left hand ends and four thereof adjacent to the right hand ends of the main heddles; and Figs. 4 to 11 inclusive are diagrammatic end views taken from relative positions of the main and supplemental heddles during the weaving of the cloth, Figs. 4 and 5 indicating the positions during the plain weaving throughout the full width of the cloth at the starting of the weaving, Figs. 6, 7, 8 and 9 the positions at the starting and during the weaving, which includes the twill strips or bands with the plain weaving, and Figs. 10 and 11 the positions during the final plain weaving finishing the cloth. Figs. 1 and 2 show the cloth of my invention, and Figs. 3 to 11 inclusive indicate the heddle positions for the production of the cloth.

The wire cloth will vary in width, as heretofore, and be formed of the usual fine warp and weft wires 15, 16 customary in weaving wire-cloth for paper-making machines.

The cloth throughout the greater part of its body portion is of the usual plain weave, and the novel feature of the cloth resides in the presence therein, along each longitudinal edge, of a strip or band 17 of twill

weaving merged into the plain weaving, this strip or band preferably being about one inch in width and extending nearly the full length of the cloth. The cloth at its opposite ends will have plain weaving for a limited extent across its entire width, as shown at the left and right hand ends of Fig. 1, to enable said ends to be properly joined together in the usual manner.

The plain weave in the cloth between the longitudinal planes of the inner edges of the strips or bands 17 is produced in the customary manner in a loom having the usual main heddles, A, B, diagrammatically represented in Figs. 3 to 11 inclusive, and the plain weave at the opposite ends of the length of cloth and in direct line with said strips or bands 17 is produced by the eight short heddles 1, 2, 3, 4, which during such plain weaving have the movements represented in Figs. 4 and 5. The warp wires are not threaded in those portions of the main heddles, which are in line with the heddles 1, 2, 3, 4.

The twill strip or band 17 is produced by the four parallel supplemental heddles 1, 2, 3, 4 adjacent to each end of the main heddles A, B, the supplemental heddles 1 being at the front and the supplemental heddles 2 at the rear end portions of the main heddle A, and the supplemental heddles 3 being at the front and the supplemental heddles 4 at the rear of the end portions of the main heddle B, as shown in Fig. 3, the heddles 2, 3, thus being close together and between the main heddles.

The weave of the band or strip 17 will be understood from Figs. 1 and 2, and will be recognized as a two-up and two-down twill weave, each warp wire 15 alternately being over two weft wires and under the next adjacent two weft wires and being so laid by the movements of the supplemental heddles through which said warp wires are threaded, as diagrammatically illustrated in the drawings.

The warp wires for the main body of the cloth are, between the inner ends of the short heddles, 1, 2, 3, 4, alternately threaded through the respective heddles A, B, as usual, and the warp wires for the opposite side portions of the cloth are threaded through the heddles 1, 2, 3, 4, which are employed at the starting of the weaving operations to, in conjunction with the heddles A, B, produce the plain weave, then to produce the twill strips or bands while the heddles A, B make the plain weave between said strips or bands, and finally to, in conjunction with the heddles A, B, complete the length of cloth with the plain weave extending throughout its entire width. In threading the warp wires through the heddles 1, 2, 3, 4, the first wire in each set of four wires will be threaded in heddle 1, the second in heddle 3, the third in heddle 2, and the fourth in heddle 4.

During the plain weaving at first end of the length of cloth the heddles 1, 2 and heddle A move together and the heddles 3, 4 and heddle B move together, said sets of heddles having alternate up and down movements, as indicated in Figs. 4 and 5. The twill weave will start with the heddles in the position shown in Fig. 6, with the heddle A and heddles 1, 2 down, and the heddle B and heddles 3, 4 up, and the next move of the heddles will be to the position shown in Fig. 7, with heddles 1, A, 4 up and heddles 2, 3, B down; the following movement of the heddles is represented in Fig. 8 showing heddles 1, 2, B up and heddles A, 3, 4 down; while Fig. 9 represents the final one of the cycle of movements of the heddles in making the twill weave and shows heddles 1, B, 4 down and heddles A, 2, 3 up. At the finish of that part of the weaving which includes the twill bands or strips, the heddles are all given the

requisite movements for the plain weaving shown in Figs. 10 and 11, which movements are repetitions of the movements indicated in Figs. 4 and 5.

It is believed that the method of producing the wire cloth will be fully understood from the foregoing description and the accompanying drawings without further explanation.

It is customary in weaving wire-cloth to provide in the loom a stiff wire at each side over which the filling or weft wires are folded, leaving loops 18, at the edge of the cloth, said wires forming no part of the cloth and the cloth stripping itself from said wires as it approaches and is wound upon the breast beam of the loom, and in the weaving of my cloth I make use of said wires for their usual purposes.

The wire-cloth of my invention is very durable and capable of withstanding long use. Various means have heretofore been resorted to for resisting the tendency of the wires, in wire cloth of the class to which my invention pertains, breaking near the longitudinal sides of the cloth.

Ordinarily a few silk and cotton threads are woven, with the plain weave, into the edge portions of the cloth but these have not been efficient, although they are in almost universal use. My invention dispenses with the employment of the aforesaid silk and cotton threads and also of wires when they have been suggested for said threads. The twill weave bands constituting integral parts of my wire-cloth render the cloth as a whole of increased durability and value.

NORWAY AND DENMARK.

The Trade Commissioner of the Dominion Government in Norway and Denmark has the following to say regarding present conditions in those countries:—

Under the circumstances there is very little business doing in pulp, as no export can take place, so the market as a consequence is entirely down. There is no money to obtain from foreign countries, and whether the mills can be kept running will depend on what position the banks take towards furnishing money for wages. Further it is feared, that the cellulose and paper mills must close down for want of coal; but this does not concern the mechanical mills, that are run by water power. During the next week the Wood-pulp Association of Norway is going to have a meeting, when a resolution will be adopted as to the position the mills are going to take during the present crisis.

According to a report by the Norwegian Consul-General at Copenhagen the import into Denmark of wood-pulp during the first quarter of 1914 as compared with the same period in 1913, was as follows:—

		English tons.	
		1914.	1913.
Mechanical, dry	79,600	175,600	
Mechanical, moist	7,494,000	7,158,000	
Chemical, dry	300,400	321,300	
Chemical, moist	4,687,500	2,619,300	

The Iggesund Company, which with a capital of \$800,000 carries on a woodpulp mill and an iron foundry, has resolved to start a sulphite and sulphate mill with an early production of 10 to 12 thousand tons (English).

The shareholders in the Russian stock company "Dubrowka," which was started by Scandinavian business men, held their yearly meeting of the directors in Christiania a short time ago. It was resolved to enlarge the capital from 2 million roubles to 4 millions and to buy a new paper machine, whereby their paper production will come up to 18,000 tons (English) per year.

PULP AND PAPER NEWS

George Davidson, Toronto representative of the C. Howard Smith Paper Mills Co., Montreal, has opened offices at 124 Richmond Street West, Toronto.

The Algoma Timber and Lumber Co., a corporation under the laws of Michigan, empowered to purchase and sell timber and to manufacture it into its respective uses, has taken out a supplementary license to do business in Ontario, and has appointed Wm. E. Brown, of Sault Ste. Marie, as the representative of the company, which is authorized to spend one hundred thousand dollars in the province.

Joseph Kilgour of Kilgour Bros., Toronto, who is President of the Canada Paper Co., has again placed his fine property, Sunnybrook Farm, near Toronto, at the disposal of the Ontario Plowmen's Association for the holding of the Provincial plowing match which will take place on November 6. Valuable prizes will be offered in a large number of classes.

The Monarch Paper Co., Limited, has been granted a charter. The capital stock is forty thousand dollars and the headquarters are in Toronto. The company, the incorporators of which are Lewis F. Houpt, Alex. R. Currie, Fred J. Smith and Eugene Houpt all of Buffalo, and Ed. A. Crippen of Toronto, is empowered to manufacture, sell and deal in all kinds of paper and to carry on a general paper jobbing business.

Robert Davies, of Toronto, who is President of the Don Valley Paper Mills, and an enthusiastic horseman, recently secured some high class material at the Haggin yearly sales held at Sheephead Bay, N.Y. In all five head were purchased for \$8,500, including the highest priced youngster of the sale, for which \$3,000 was paid. If breeding counts, the quintette should develop into high class racers for Mr. Davies' stable.

Carbon paper and typewriter ribbons, which have been imported largely from Germany and Austria, will now be made to a greater extent in Canada. Local dealers report that the stock on hand is fairly large. Canadian firms are getting a move on, and will endeavor to meet the demands of the market. This is an opportunity which they are taking advantage of, owing to the war, and it is expected that many others will develop in the paper line.

The new storage warehouse, which has been erected for the Howell Trading Co., on George Street, Toronto, is completed. It is of mill construction, 80 x 100 feet, and four storeys high. One floor and a portion of the basement are bonded warehouses. The new building, together with the present quarters of the Howell Company, afford fifty-five thousand feet of floor space. There are six wide shipping doors, two, three-ton freight elevators and all modern accessories. The company have already entered into several contracts for the storage of paper, felt and other lines of goods, while a delivery service is also being conducted.

Numerous requests have been made to the Ontario Government from manufacturers suggesting that, in view of the unsettled condition in industrial matters,

it would be advisable to delay putting in force the provisions of the Workman's Compensation Act, scheduled to come into force on January 1st next. The manufacturers say that they could not bear the extra burden of that the operation of the act would entail, and which would be of no benefit to those thrown out of employment. The matter has not yet been discussed by the cabinet, but is probable that a decision will be arrived at an early date. The general feeling is that the Act will not be put into operation until the industrial situation clears and settles somewhat.

At a representative meeting of every industry and class of business, which was held in the Toronto Board of Trade rooms and presided over by W. P. Gundy, Managing Director of W. J. Gage Co., and the Kinleith Paper Co., ways and means were discussed of fostering Canadian trade during the war. It was felt that the present was a very opportune time for Canadian manufacturers to extend their markets and make new lines heretofore imported into Canada, and that the stimulation of Canadian manufactures in this way would necessitate full staffs and relieve unemployment. A special committee was appointed to gather statistics and present suggestions.

Statistics show that for the year ending March 31, 1913, there was imported into Canada from Germany in paper and stationery \$571,850 and in chemicals \$833,300, and an effort is being made by certain Canadian firms to take advantage of these new openings. Owing to the impossibility of getting parchment, greaseproof, glassine, onion skin, and highly glazed kraft and other papers, a number of Canadian mills are considering the advisability of making these lines and are conducting investigations. The result of their decision will soon be arrived at. Some firms in Montreal, Toronto, and other cities, which have handled paper from Germany and Austria are disposing of their stocks and will close their doors owing to the inability of securing further supplies, at least for the present.

Toronto paper firms and publishing firms were not very generous in the matter of subscriptions to the Patriotic Fund, but have come forward with liberal offers in the stationery and printing for the Y.M.C.A. camp at Valeartier. The initial supply was fifty thousand letter heads and twenty-five thousand envelopes, which disappeared at the rate of five thousand sheets a day. Last week the National Council of the Y. M. C. A. were the recipients of large gifts for correspondence paper, envelopes, etc. Buntin, Reid Co., heads, and Barber, Ellis, Limited, two hundred thousand envelopes, printed, while the Southam Press did the printing on the letterheads. Twenty-five thousand hymn books, printed on rope paper with jute tag cover, are being presented to the soldiers in camp by the Y.M.C.A. The book consists of fifty-two pages. The paper for the hymn books was kindly supplied by the Don Valley Paper Mills and the Ratcliff Paper Co., Toronto; the Methodist Book and Publishing House set the type, W. J. Gage Co., did the press work and Brown Bros., the binding. The quantity of stationery will last the camp a month, and the action of the Toronto concerns is highly commended.



The Markets

CANADIAN MARKETS.

The pulp and paper industry is one of the most favorably influenced by the war, and while some lines may suffer, such as wrappings, building papers, and specials, the general condition of affairs is active. News print mills are rushed to one hundred per cent efficiency and inquiries still pour in from all quarters of the world. To the credit of all Canadian plants it must be said that they are taking every precaution to first protect and safeguard the interest of their customers, and what overplus they have, if any, they are disposing of to the best advantage. News print prices are very stiff and are now all arranged on individual basis rather than current quotations. The exporting mills have a great dear more business than they can attend to and some plants which have been making wrappings and specialties, are now directing their full energies on news print. Several Canadian papers have reduced the number of their pages. Ground wood mills are also busy, and practically all stored stock has been sold. Prices are stiffening and sixteen and seventeen dollars per ton is being freely obtained at the mills, while delivered, the figure is from \$23 to \$25 and even more to distant points, where freight rates are not favorable. The demand for sulphite, both bleached and unbleached, is keen, and prices are largely a matter of arrangement from day to day.

Some fantastic stories have been circulated in the trade regarding the figure that certain mills have been offered and, while many insistent requests have been made for the delivery of large quantities, there is no doubt much exaggeration regarding prices, which have been withdrawn by the producers. Book and writing plants, as well as coated paper plants, have withdrawn their figures, but so far there has been no increase in prices, and the manufacturers say that it is too early as yet to make any predictions. It all depends on the figure that sulphite pulp and other supplies will reach. Columns have been written on the state of the markets, but, as a matter of fact, the war has not been waged long enough to radically alter the situation of affairs, but when the stocks on hand are used up and new contracts have to be made, there may be a totally different story to tell. The real facts regarding supply and demand will then come out, and what may be said at present is largely speculative. Strong kraft pulp has taken a big jump, and the discount on carload lots of paper to jobbers in Manilla, fibre and other lines have been withdrawn by some manufacturers.

That the outlook for business in the mercantile arena is not nearly as dark as has been painted, is evidenced by the fact that two big departmental stores in Toronto have again placed their orders for book and coated paper for fall catalogues with a large Canadian mill, and in one case the usual order was increased from ten to fifteen per cent. Book and writing mills are well employed so far and they take a hopeful view of the outlook. The war has had another effect, and that is a number of mills are looking into the possibility of making special lines of foreign papers to supply the Canadian trade. No decision has been ar-

rived at, but the advantages and cost are being carefully investigated, and some interesting announcements are expected soon. Imports of all foreign papers have been almost completely stopped and stocks are growing low. There have been increases in some lines of tissue and toilet papers to those not protected by contract. Many plants are cutting out colors as much as possible.

In the rag and paper stock market the prices on foreign roofing stock has gone up from thirty to forty per cent, owing to war insurance, increased freight rates, higher exchange and the handicaps in shipping. Still Canadian handlers report that several good offers made to British firms have been accepted. Locally, prices have taken a strongly ascendant turn. Mixed papers are in great demand, and the country is being scoured for supplies. Domestic rags are scarce. One effect has been reported by dealers and that is, mills are less inclined to reject materials now, accepting them without protest.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.25 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$3.75.
 Manila, B., \$2.90 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.10.
 Unglazed Kraft, \$3.50 to \$4.50.
 Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$17.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$48 to \$50, delivered in Canada.
 Sulphite (unbleached), \$50 up, delivered in United States.
 Sulphite (bleached) \$58 to \$59.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.80 to \$1.90, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 50c.
 White blanks, 95c.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 80c.
 No. 1 Manilla envelope cuttings, \$1.15.

No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 35c to 37½c.
 Old white cotton, \$2.50 to \$2.75.
 Third sand blues, \$1.40 to \$1.50.
 No. 1 white shirt cuttings, \$6.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinet, 90c.
 Flock, \$1.00.
 Tailor Rags, 80c.

Prices in Montreal remain about the same, the only difference being in the substitution of spot quotations instead of contracts.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

All the bush rangers, which have been employed during the summer months by the Ontario Government and have been doing duty in the north country, have been released for the balance of the year. The heavy rains have put out all the forest fires, and made it unnecessary to retain the rangers any longer.

NEW YORK MARKETS.

New York, September 12, 1914.

The early excitement of the paper trade in the country has subsided to a large extent. Markets in all branches of the trade are now fairly well settled, and price quotations are stiff. Prices in all grades of paper have advanced.

Manufacturers have pursued in most cases a conservative course in withdrawing prices and accepting orders for not later than thirty days' delivery. The foreign pulp situation was the cause of most anxiety among paper manufacturers. Importers did not take any undue advantage of the situation and supplied all customers as far as possible with the light imports that came into domestic ports since the beginning of the war. Pulp prices advanced rapidly, but during the past two weeks maintained firm values. Importers have not stored pulp, although paper manufacturers here have been of the opinion that speculation has been the chief factor in the rising markets. Additional costs of importation were the causes of the higher prices. Stocks on this side have not been large, and what new pulp came over since the war, was subject to heavier freight charges, high insurance rates and payment for such lots was subject to a high rate of exchange. All these things added about 25 per cent to the c.i.f. cost of pulp.

The opinion prevails here that there is no real cause for fear of a pulp famine in this country, as domestic mills together with the surpluses of paper mills operating pulp plants could make enough sulphite to meet the demands of paper manufacturers. It is admitted that the higher costs of wood will add somewhat to the price of pulp. This price, it is believed, will not go far above the present quotation of 3.10c to 3.50c for bleached and 2.25c for unbleached sulphite, if at all.

There has been a considerable boom in rags and paper stock. A good deal of the rising prices was due to the trading amongst dealers, a number of whom preferred making sales to their own trade to seeking business from mills. Dealers engaged in this method are of the opinion that there will follow large rejections by mills and rather than stand the results of arbitration, rag dealers will accept a reasonable profit from other dealers. Packers are inclined to hold stock as closely as possible, and in some cases have held up deliveries hoping to sell the goods at a higher price than was to be paid for the original requests. The scarcity of linens has brought about a heavy demand for shirt cuttings, which are quoted about 6½c to 7c a pound. Old waste papers received active inquiry during the period of pulp shortage. Mills drew heavily on stored stocks of shavings which advanced in price to as high as 2¼c to 2½c a pound. Old kraft papers have been in good demand at 1.35c. During the early part of this month paper men began to take a more optimistic view of the situation. Business took a turn for the better, and the market has reflected a healthier, though somewhat spasmodic, tone.

Pulp.

The situation in ground wood pulp has remained essentially unchanged. Grinders have been willing to take orders for pulp at prices somewhat lower than the fancy quotations that at first appeared. The prevailing market value is \$17.50 to \$18.25 a ton, f.o.b. ground wood mill. The news that 500 tons of ground wood pulp was en route from British Columbia

via Panama Canal to New York, was received with some satisfaction by a number of paper mills.

Imported bleached sulphite is scarce, and spot lots are in only small quantities on the dock. The values of this grade range from 3.25c to 3.50c a pound, ex-dock. Domestic bleached sulphite has been in fairly good demand at 3.10 to 3.35 f.o.b. sulphite mill. Unbleached sulphite pulp has been sold as high as 2.50 for imported grades. Prime qualities are not available. Domestic agents have sold unbleached sulphite at prices ranging from \$42 to \$45, f.o.b. sulphite mill. Soda pulp advanced from 1.80 to 2.25. Fairly frequent shipments of kraft have been made, but most of this was for shipment on outstanding contracts. Some spot lots are available at 2.20c to 2.35c.

The demand for old waste papers continued very good, and prices continued to go up. Hard shavings have sold from 2.65c to 2.80c a pound, and soft whites have advanced to 2.25c to 2.45c a pound. Mixed papers and old Manillas have been in good demand and prices have been quoted at 1.00c to 1.10c and 45c. Bleached sulphate, impt., 3.00 to 3.20, ex dock, to 47 1-2 respectively. Quotations are:

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$17.50 to \$20, delivered.
Unbleached Sulphite, dom., 2 1/8 to 2 1/4 f.o.b. mill.
Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.
Bleached Sulphite, domestic, 3.10 to 3.35.
Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
Easy Bleaching, impt., 2.75, ex dock, New York.
Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.
Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
Kraft Pulp, 2.25 to 2.30 ex. dock, New York.

Paper.

Conditions in the local paper market have gradually changed it to a more normal state. The wild excitement that characterized the early period of the war when jobbers rushed to cover understocked warehouses, has gradually waned, until a fairly steady market with firm prices predominated. Newsprint has continued to move rapidly in contrast. Some manufacturers moved during the month of August considerably more of their product than they made, while running all machines full capacity. Others have notified their customers that it will be impossible for them to demand any more than their maximum pro rata consumption call for. Sheet news advanced to 2.35 f.o.b. New York. Transient orders for rolls have been rather scarce. Export inquiry continued fair and manufacturers moved good volumes to South America, Australia, South Africa, England and France at good prices. It was reported that the British market was bringing 2 1/2c American ports, purchasers assuming all war risks. Wrapping papers were in rather quiet demand, although prices average about 1 1/4c a pound higher for all grades. Writing paper mills have withdrawn quotations and some have raised their prices. Book papers were in good demand. Some grades have advanced slightly, but the general market value has remained unchanged. Tissue papers have been in good demand. New York quotations are 47 1/2c a ream for No. 1 white and No. 1 Manillas in car lots, and 50c in cars.

Paper bags advanced 1 per cent under a fairly good demand.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$2.05, f.o.b.
News, side, runs, 2.25.
News, sheets, 2.35, f.o.b. New York.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13 3/4c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4 1/2c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 5 1/4c to 5 1/2c, delivered.
Manila, wood, 2.75 to 3.25, delivered.
Kraft, No. 1, \$3.85 to \$4.00 f.o.b. New York.
Kraft, No. 2, \$3.35 to \$3.75 f.o.b. New York.
Boxboards, news, \$30 per ton, delivered.
Boxboards, straw, \$28 per ton, delivered.
Wood pulp board, \$42.50 per ton, delivered.
Tissue, white, cylinder, 47 1/2 to 50c f.o.b. New York.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, jute Manila, 47 1/2c to 50c f.o.b. New York.

DISPUTE OF WAR LEADS TO TRAGEDY.

According to information from Millinocket, Maine, more than fifty lumbermen battled in the woods at Grand Brook recently after an argument over the European war. One man was killed and three were injured. Grand Brook is fourteen miles in the woods.

Two sheriffs who went to the scene with deputies are reported to be on their way here with 53 prisoners. The lumbermen are part of a crew of the Great Northern Paper Company. Most of them are Poles and French Canadians.

RAILWAYS CANCEL OLD OCEAN RATES.

It is learned in Ottawa that on September 10 the railways will cancel the through freight rate from Canada to the Old Country. The Railway Commission in dealing with the matter, found that the ocean rates are being increased owing to the heavy insurance charges due to the war, but the rail charges remain the same. The commission therefore cannot interfere. This will add to the cost of marketing the Western crop.

WILL CANCEL ALL GERMAN PATENTS.

It is understood that the Government will pass an Order-in-Council within a few days cancelling German and Austrian patents and trade marks in Canada. Hundreds of such patents have been taken out in Canada and they relate chiefly to chemical preparations, patent medicines, photographic and electrical supplies. The specifications for these patents will all be available here and new applications for the patents will be accepted from Canadians.

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At a meeting of the bondholders in Montreal, the affairs of the company were placed before the meeting, which was afterwards adjourned until October 1st without any definite action as to the future policy of the company being taken. This was necessary because no information had been received from France as to whether or not the notices calling the meeting had been published there, and that as a result of the war and interrupted communications bondholders were not certain as to whether or not this week's meeting was legal.



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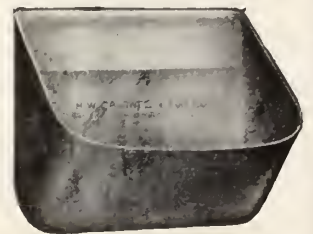
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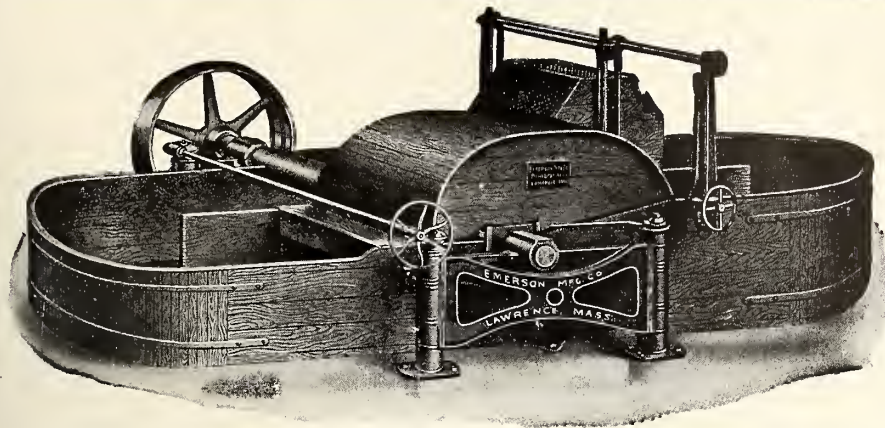
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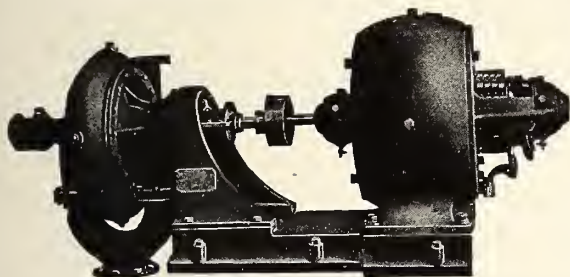
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	Feet B.M.
HEMLOCK	87,301,000
BALSAM FIR	44,444,000
SPRUCE	43,244,000
CEDAR	27,779,000
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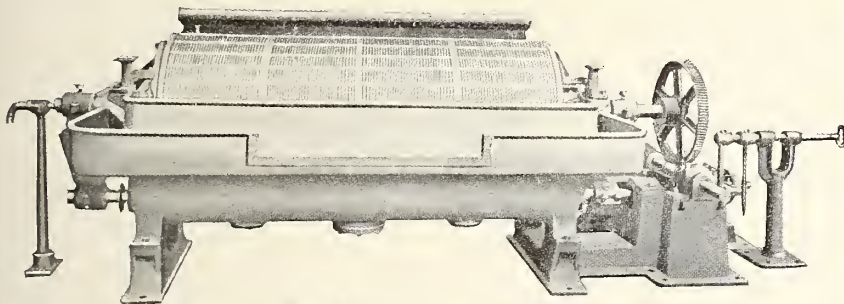
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- Air Compressors**
Blethen, Hugh R., New York
- Air Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkers**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
- Belting**
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Reddaway, F. & Co., Montreal, Can.
- Belting "Camel Hair"**
Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Blowers**
Sherbrooke Mach. Co., Sherbrooke, Que.
- Boilers**
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Fourdrinier Wires**
Capital Wire Cloth and Mfg. Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calendar Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticizing Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can.
Wison-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chip Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg. Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweller, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
- Digester Lining**
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Engineers Ltd., Montreal, Can.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Felts**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

Trolleys

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Holsts.

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.

Holsts—Chain Electric and Pneumatic

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines

Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.

Kulves

Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.

Kollergangs

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines

Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.

Motor

Chambers Ltd., 152 Bay Street, Toronto.

Presses

Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Beschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.

Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.

Paper and Pulp Machinery

Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachometers

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester

Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.

Pneumatic Thickeners

Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.

Pneumatic Chain Blocks

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls

Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.

Pulp Stones

Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England

Pumps

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Recording Gauges

Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Refiners

Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Marx, J. & Co., London, E.C., England.

Process Engineers, Ltd., Montreal, Canada.

Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma

Voith, J. M., New York, N.Y.

Waterous Engine Works Co. Ltd., Brantford, Can

Rope Blocks

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size

Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers

Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Can.

Rotary Silver Screens

Jensen og Dahl, J. & A., 1 Broadway, New York City

Rotary Sulphur Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.

Runways—Hand operated

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls

Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Holsts

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens

Bertrams Ltd., Edinburgh, Scotland.
Bozner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs

Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelling Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters

Bertrams Ltd., Edinburgh, Scotland
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters

Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator

Pickles, W. F., Buckland, Conn.

Stuff Chests

Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch

Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.

Sulphite Engineering and Manufacturing Co., Watertown, N.Y.**Sulphate Mill Equipment**

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.

Sulphur

Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.

Tachometers (Hand and Stationary)

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Truck Systems

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers Limited Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Travelling Cranes

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Tippet, Arthur P. & Co., Montreal, Can.

Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatichouan Falls Paper Co., Ouatichouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmillier, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.E.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Meriton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manila."

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que., and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Spe

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained

W. W. Cory

Department of the Interior, Ottawa,
December 20th, 1912.

Deputy Minister

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd. St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

ibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co., Ltd., East Angus, Que.
 Dominion Paper Co., Ltd., Montreal, Que.
 Dryden Timber and Power Co., Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand"
 Crabtree and Son, Edwin Crabtree Mills, Quebec.
 Donnacona Pulp and Paper Co., Donnacona, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B. Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co., Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal, Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre"
 "Invictus Fibre," "Hercules Manila," "St. Francis Manila," "W.
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B. Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Crendon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 81 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

WANTED—Pulpwood General Superintendent wanted for the supervision of a very large operation. Must have thorough experience and be a pulpwood specialist. Operation is a large one and requires good operator and good business man. State in full, experience, present position, age and other particulars in confidence. Apply, Cheap Pulpwood, care of Pulp and Paper Magazine, Montreal.

NIGHT FOREMAN wanted for Canadian pulp mill; state experience, references, full particulars. Reply to Box 88, Pulp and Paper Magazine, Montreal, Que.

A RELIABLE AMERICAN PAPER MANUFACTURER is desirous of purchasing fifty-thousand cords of pulpwood annually for a term of years. Wood to be delivered by boat on River St. Lawrence. Correspondence solicited. Address "American Manufacturer, care of Pulp and Paper Magazine, Montreal, Que.

MILL ARCHITECT.—Well educated, with all-round experience, is wanted for a large mill, to take charge of engineering office and construction. High salary will be paid to competent man. No one who has not held responsible position need apply. No application will be considered without full particulars with regard to education and experience. Application will be treated strictly confidential. One having knowledge of sulphite manufacturing will be preferred.—Apply 4000, Pulp and Paper Magazine, Montreal.

WANTED.—First class beaterman for box board machine. Must be steady, temperate. Address, stating age and experience, "Canada," Pulp and Paper Magazine, Montreal, P. Q.

BRITISH HOUSE.—Old established and of highest standing, with first-class references, want Agencies of good Pulp and Paper Mills. Cash advances and financial facilities granted. Box 89 Pulp and Paper Magazine, Montreal, Que.

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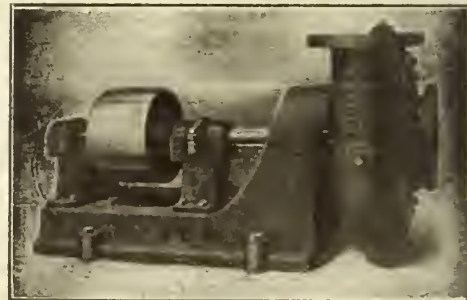
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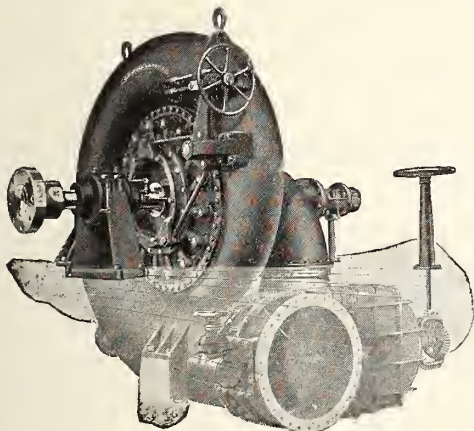
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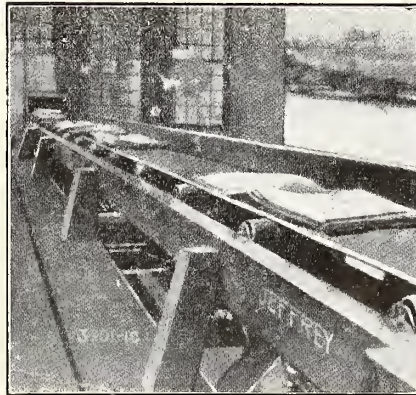
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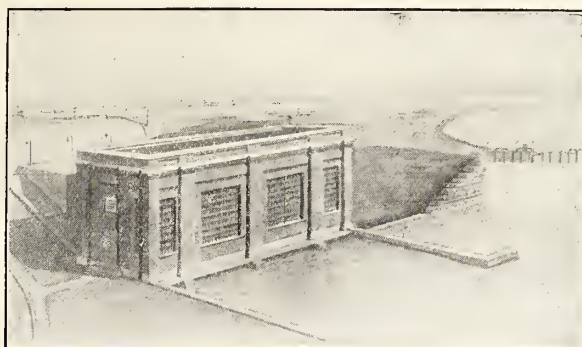
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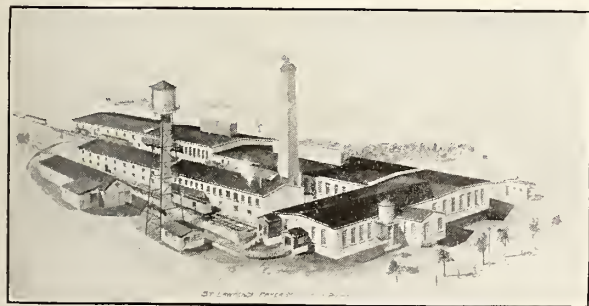
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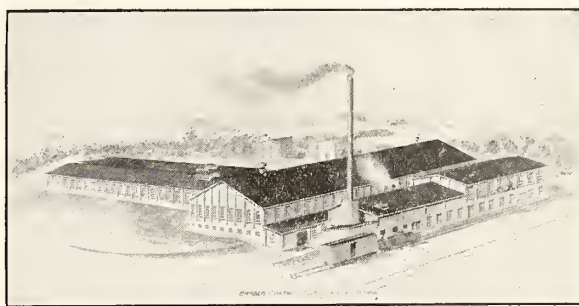
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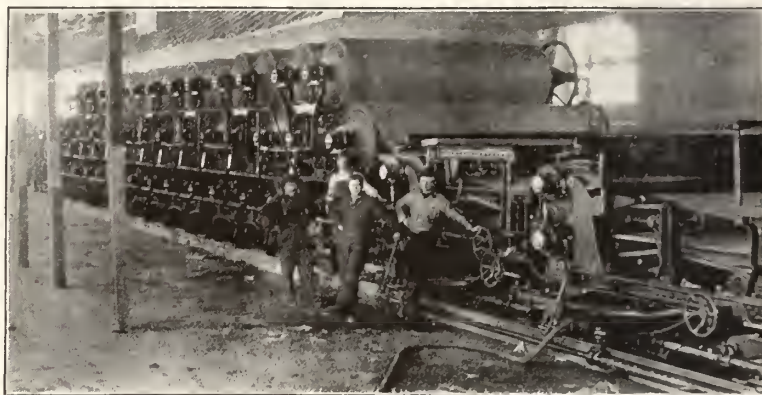
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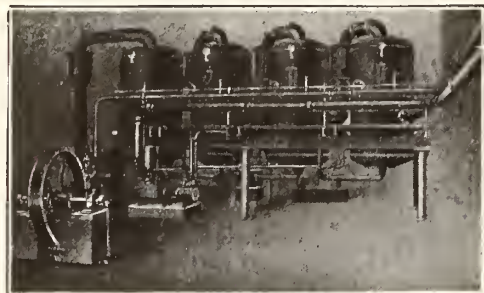
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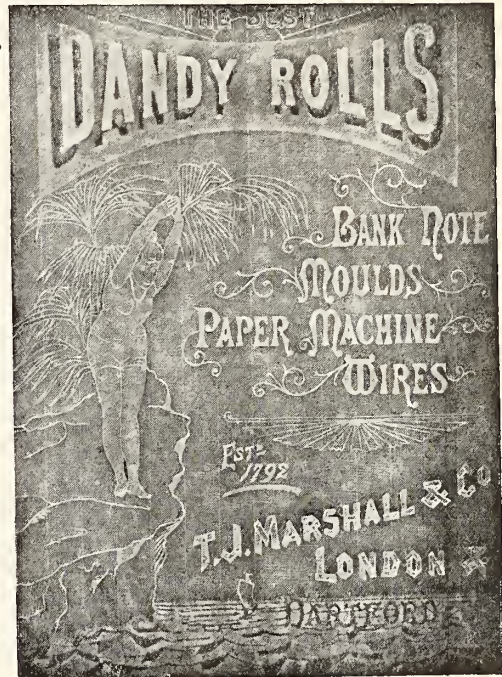
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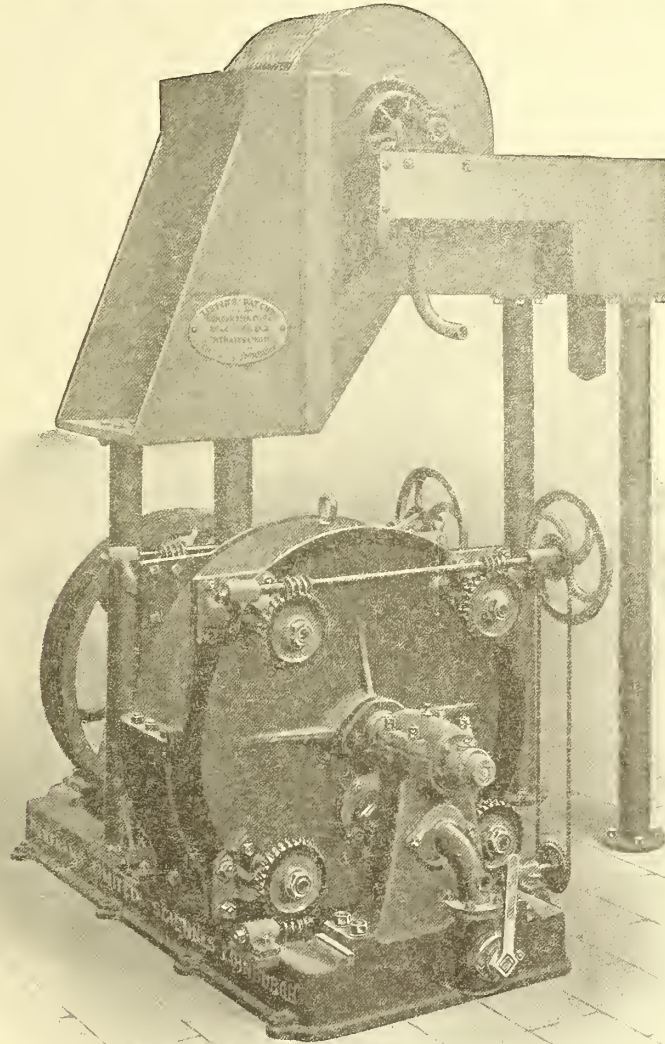
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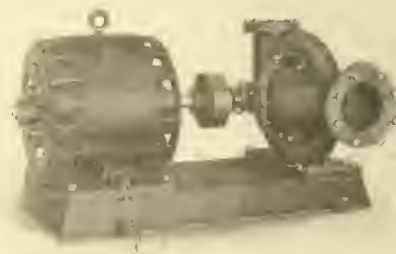
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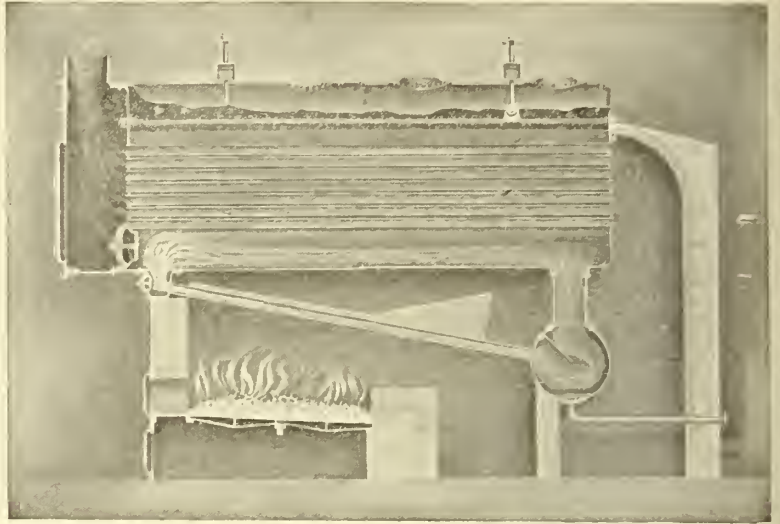
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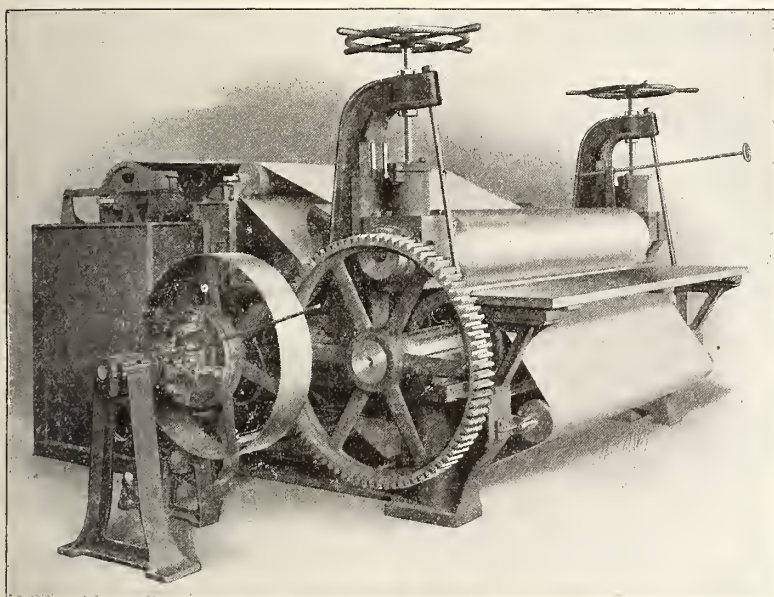
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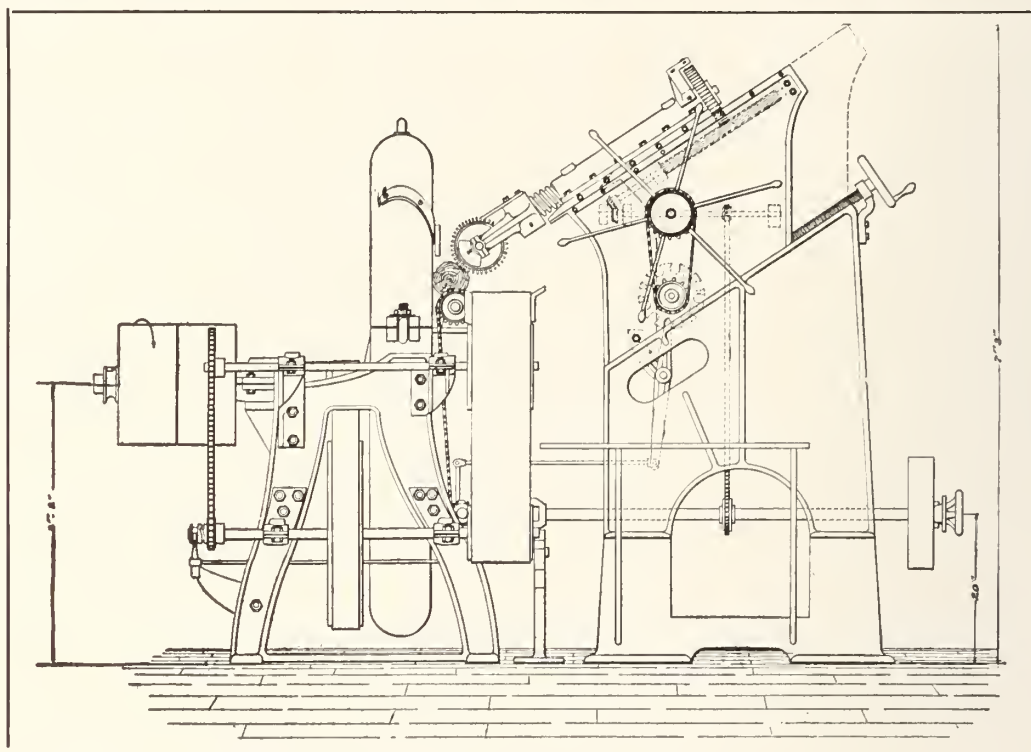
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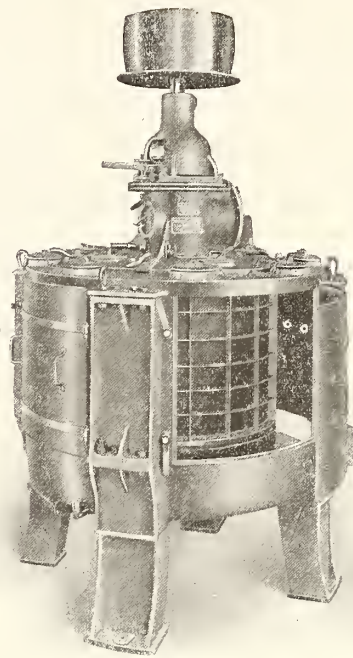
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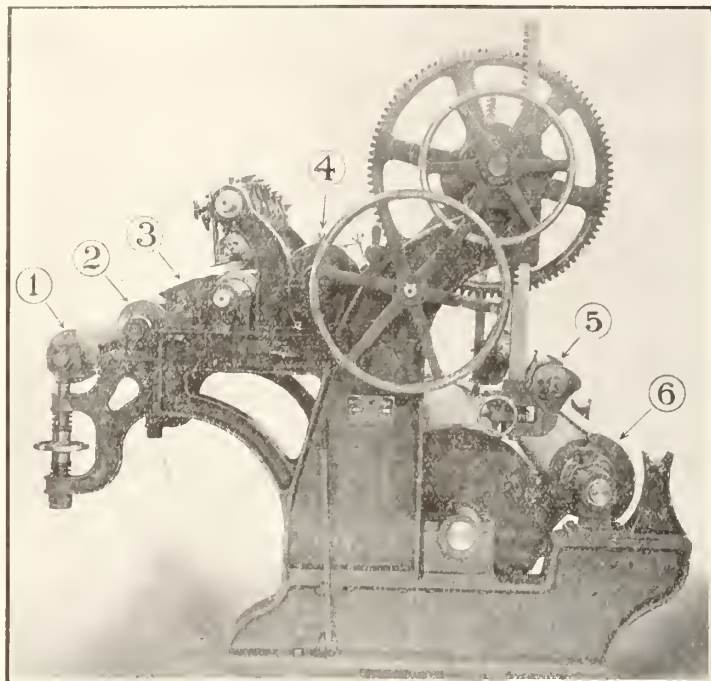
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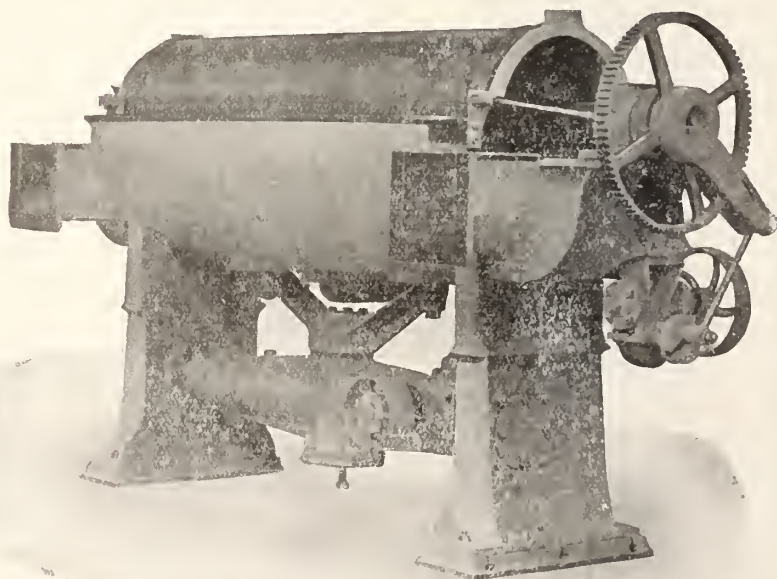
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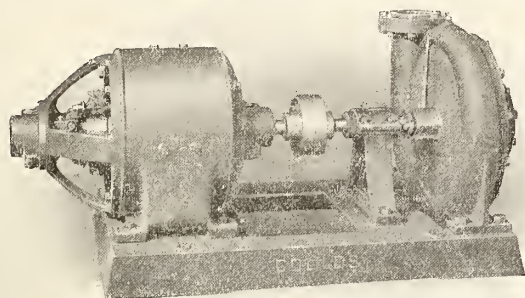
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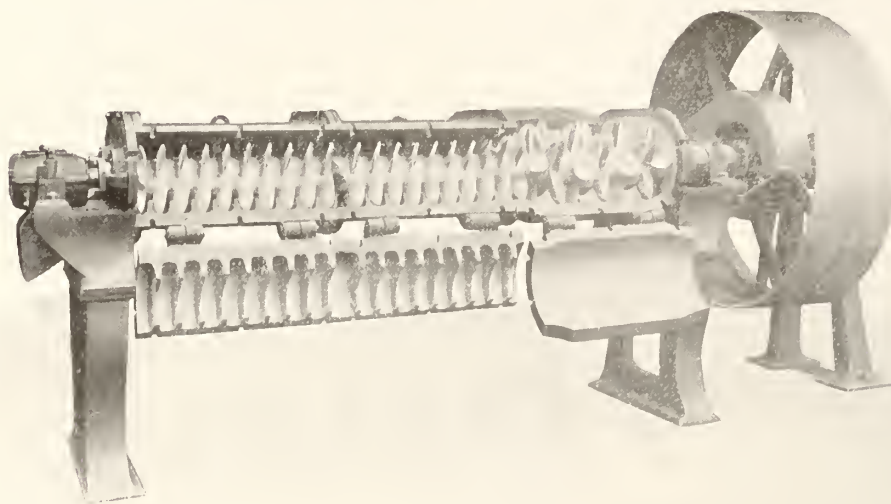
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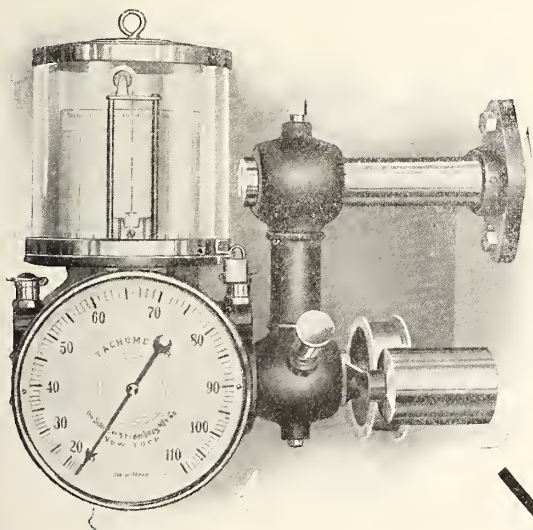


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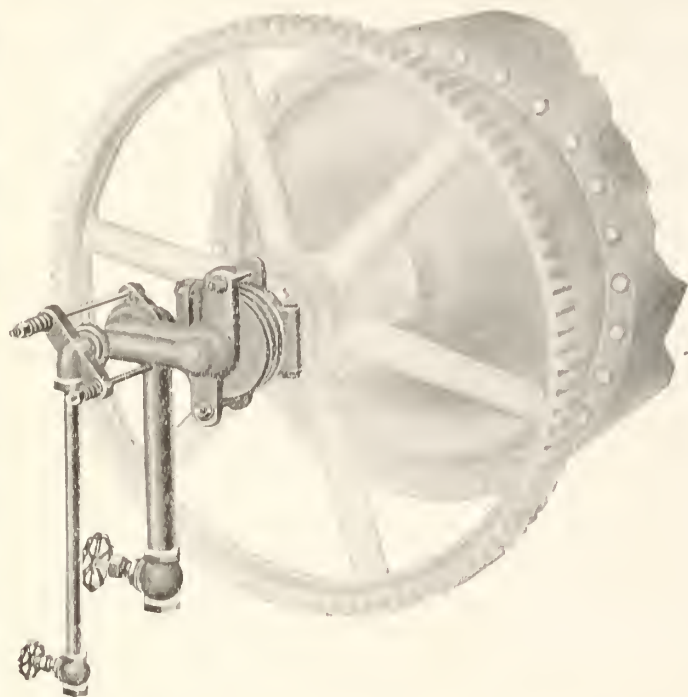
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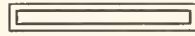
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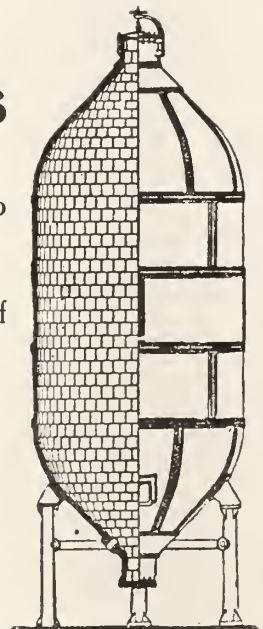
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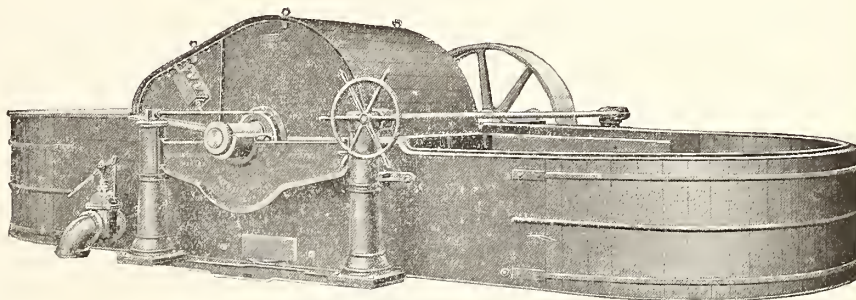


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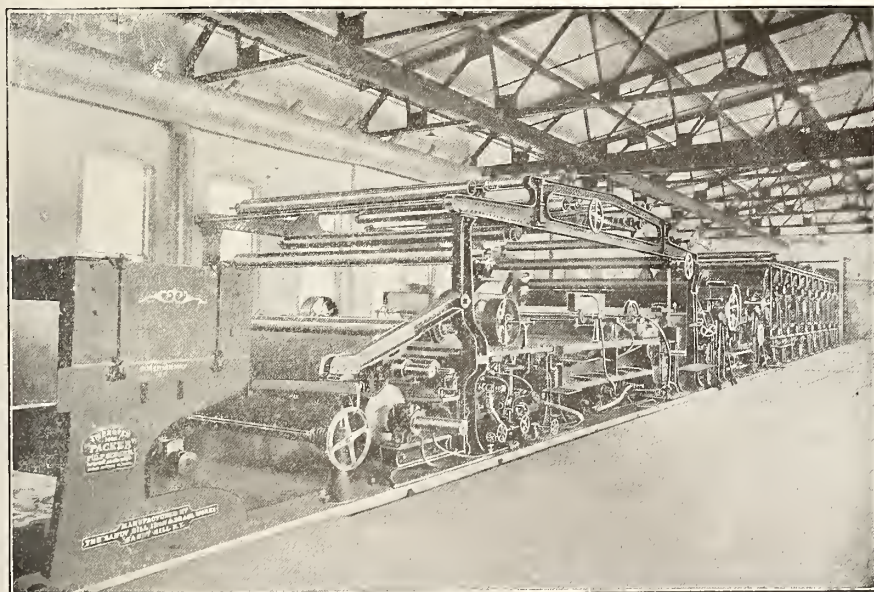


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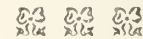
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VOL. XII.

MONTREAL, OCTOBER 1, 1914

No. 19

GENERAL OUTLOOK.

The Department of Labor in Ottawa has issued a lengthy summary of labor and industrial conditions throughout Canada which is exceedingly encouraging, and shows that there is a general revival of business following the depression when war first broke out; efforts, the report states, are being made all over the country to keep factories running and to maintain industry unimpaired.

It is pointed out that while a great number of establishments have closed down altogether, and others are operating on short time, the war has with some industries given business an impetus. Chief among these, according to the report, are flour milling, transportation, textiles, and last but not least, the pulp and paper industry. The Department says that the campaign which arose instantly after the war for the manufacture in Canada of articles which formerly had been imported from Germany, and the plans laid to capture some of Germany's export trade in commodities which could be manufactured in Canada were at the end of the month of August making headway, and a general feeling of confidence in Canada's ability to weather the industrial storm was being restored. Further, the tide of immigration which has been falling off since last December has since the outbreak of war become practically nothing. Hence with the depletion of the ranks of industry to fill the fighting forces and the readjusting to meet industrial conditions, the number of the unemployed is regarded as about normal.

This report of the Government's is most cheering at the present time. Our business may have to contract, and as a nation we may have to forego many of the comforts that we previously enjoyed, and must also leave off investments of a speculative nature, but we seem to be running with a fair degree of smoothness.

RESEARCH IN BEATING.

In the course of a few weeks, it is our hope that there may appear in the Pulp and Paper Magazine an account of the developments in the new Forest Products Laboratories, whose organization is now going ahead rapidly under Dr. J. S. Bates. While nothing can be done until the apparatus is in place, which should be some time in November, it is most important that members of the pulp and paper industry should grasp the significance of this new step and be prepared to welcome the work of Mr. O. F. Bryant, who has pulp and paper in hand, and to assist in every way possible with the development of the researches.

That the Dominion Government should have seen so early in the history of the industry the desirability of making extensive experiments which might serve as an impetus to manufacturing, is indeed a source of satisfaction to all who have the interests of the country and of science at heart. Our paper industry is just in its infancy, and the working out of problems to-day will serve to clear the way for the great march of progress that is sure to take place where natural resources, national ideals and the confidence of foreign investor and immigrant alike are apparent to so great an extent.

The Forest Products Laboratories have just received their new beaters.

To the lover of papermaking, particularly the man of scientific bent, be he technically educated or not, the very mention of experimental beaters is enough to give a lasting thrill of delight. New worlds lie open to the fortunate possessor. Without the demands of commercial production day in and day out hanging over his head, as they do over the heads of men engaged in the ordinary way of business; without the necessity of going into one line of investiga-

tion, but free to take up the work which appears to be of greatest service to all concerned the laboratory investigator has a glorious field before him. The one department of beating is enough to keep him studying from now until Doomsday. It is pleasant to reflect that on this question, which according to Clayton Beadle, occupies a pre-eminently important position in the process of papermaking, the Laboratory will soon be in a position to initiate its studies.

"The sheet," says Mr. Beadle, "may be said to be made or marred in the beater house, and no amount of care or skill on the part of the machine man will rectify carelessness or want of skill on the part of the beater man." This would lead one to ask if sooner or later by dint of experimentation scientists will not be able to penetrate the mists surrounding this operation, which now it seems possible to dissipate only by long practice.

The main difficulty in the way of the investigator who wishes to apply instruments of accurate measurement to beating is that the mechanics of beating, is, as Mr. Beadle says, complex and incapable of scientific treatment in so far as it does not lend itself to any form of numerical expression, and the mathematician or theorist must of necessity start with more or less rigid assumptions. Continental investigators have done much to advance the theoretical side of the operation of beating, but actual series of experiments speaking in the large, have been neglected. Even though German and other investigators have gone fairly deeply into the questions of power requirements and fibre lengths in the past few years, there are still great unexplored regions to venture into, whose boundaries only are known.

Since beating can produce almost any class of paper within the possibilities of the pulp being treated, every side of the question will bear the closest investigation. This is aside altogether from the immediate economic end, which concerns itself with the amount of power used per ton of paper produced.

But what, for instance, will extensive studies show as to that most confused question—the hydration of fibres under the different kinds of rolls? Again, what is the influence of chemical substances added to the pulp mass in the beater? What is exactly the result of long beating? What is the mechanics of shearing and brushing? Or, as the noted English authority quoted above further asks, what are the best procedures in regard to the mixing of pulp before beating or after beating, and what are the best uses of refiners and what thickness of pulp will give greatest efficiency to the beaters? These are but a few of the problems which await the scientists of the new Dominion Laboratories.

But to make their efforts fully available, there should be the most earnest co-operation on the part of manufacturers when the time comes. Practice, experience and long observation are essential to the success of any series of experiments. As this magazine

has already urged, in the course of the next year, beginning some time in the early winter, pulp and paper men can perform true service to themselves and the industry at large, by keeping close watch on their machines, and the results obtained, and by co-operating with the Laboratories. This science of beating for one, is still very little developed, and an infinite amount of work remains to be done. The investigation in Montreal and the experience of the mill men will do a vast amount to uplift our Canadian industry.

THE SULPHITE SITUATION.

Conditions in Norway and Sweden would seem to indicate that there will be a hard situation to face in the course of the winter. For several weeks now there has been a very great shortage of coal and two large mills there have closed down on this account. Also sulphur is lacking, it being practically impossible to import it. The water shortage of the past few months has added to the difficulties, and no matter how great the call from Britain or the United States and Canada, it is altogether probable that exports of Scandinavian pulp will fall off within six months. When the Baltic freezes up, as it will before long, it will be impossible to secure the supplies which have been coming waterborne to New York, and freight rates on the railways going across the mountains from Sweden to Norway will doubtless be raised on account of the diminution of food supplies within the two countries. We do not, of course, predict any famine in sulphite, and the attitude of the buyers in New York and other American centres at the present time would indicate that there is little fear of any tremendous curtailment, but at the same time it is probably true that the general tendency of prices of sulphite will be to rise noticeably. Prices are already fairly stiff, and stored stock is being sold at levels that would have done justice to first-class material a few months ago.

NOT ALL ROSES.

While the world looks on the paper industry and the newsprint industry in particular, as the most progressive and profitable in the present industrial crisis, it must not be thought that the paper mill which is rushed with orders now has all clear sailing, or that gold is raining in upon the manufacturers. It is true that the news mills in Canada are now rushed as they never have been before, and that in the tremendous demand for war news by the general public. The staffs of paper mills are going to the utmost of their resources to keep the supply of white paper adequate. But this demand does not indicate a clear profit. A great many of our mills have practically all their product contracted for at old rates, and there is very little new business coming in. They must simply keep up to the letter of their agreements with the newspapers, no matter what the expense, and this expense is

not by any means small. There is, for instance, the extra investment made necessary by the shortage of tin which is used in bearings. Dye stuffs are up, china clay is on the rise, alum is extraordinarily dear. There is the added trouble of the unusual strain on the machinery caused by the speeding up, and the loss in time through breakages in the paper. It has been frequently said that mills in Canada are in a position to receive an immense quantity of new business, but an analysis of the situation would show that this is hardly the case. In the past, Canadian mills have been taking advantage of the steady industrial conditions of the country to contract with newspapers for their requirements, and now that the increased demand comes, practically all the business is devoted to the concerns already booked. Nor is this condition likely to alter. Few manufacturers will see a clientele disappointed when contracts run out, and there is a demand for a greater amount of newsprint. Rather they will do everything in their power to safeguard customers and make sure that business goes along as favorably after the war as before.

EDITORIAL COMMENT.

One industry in Canada which is assured of prosperity in the near future is the manufacture of kraft. Scandinavian and German mills are being cut off, and the orders revert very largely to Canada. Twenty-seven mills in Germany are now out of business, and as a result the Wayagamack Paper Company is said to have received orders which run into four figures. There will undoubtedly be a great future to the kraft business in Canada.

TYPOGRAPHICAL ERRORS IN "THE DRYING OF PAPER."

Owing to an unfortunate oversight in the editorial and composing departments of this magazine, the excellent article of Mr. E. J. Trimbe on "The Drying of Paper" in the September 15th issue, was not properly proof-read, and several errors crept in. The instance with the proper readings are given below:

Page 535, Col. 1, 6th line from bottom—reads: "next strip was torn after passing the preceding top" should read: "next strip was torn out after passing the preceding top."

Page 536, Col. 2, 17th, 18th, and 19th lines from top reads: "per cent moisture. This is about the difference which through the calenders. This series of tests was also one containing 25 per cent of ground wood."

Should read—"per cent moisture in the finished paper and one dried at 13 lbs. pressure with but 5.4 per cent of moisture. This is about the difference which might be expected between an all-sulphite paper, and one containing 25 per cent of ground wood."

Page 536, Col. 2, 7th line from bottom.

Reads—"tively, they continue equal on passing the 6th and 8th."

Should read—"in use and Curve No. 2 to the second group of tests."

Page 537, Col. 1, 4th, 5th, and 6th lines from top.

Reads—"are practically equal containing 28.2 per cent respec- weight of water per ream. The pounds of water per dryers at the ninth dryer, which was by-passed, No. 2."

Should read—"are practically equal containing 28.2 per cent and 28.3 per cent respectively, they continue equal on passing the 6th and 8th dryers, but at the ninth dryer, which was by-passed, No. 2"

Page 537, Col. 2, 10th line from bottom:

Reads—"No 1 at atmospheric pressure. These machines were."

Should read—"No. 1 at atmospheric pressure but is nearly equal to the rate of drying for No. 3 at 12 lbs. pressure. These machines were"

Page 537, Col. 2, 2nd and 3rd lines from bottom.

Reads—"will give at a glance the approximate pressure on a dryer header, which it is necessary to maintain to a."

Should read—"will give at a glance the approximate pressure on the dryer header which it is necessary to maintain to dry a specified weight sheet at a specified speed, if the paper is pressed to a."

Page 538, Col. 1, 15th line from top:

Reads:—"be 3 per cent —."

Should read—"be 30 per cent —"

Page 539, Col. 2, 19th line from bottom:

Reads,——"Coat at —"

Should read—"coal at —"

Page 539, Col. 2, 14th line from bottom:

Reads—"—— this is a stronger argument"

Should read—"—— this is a strong argument."

BELGO COMPANY NOT DELAYED.

It appears that the Pulp and Paper Magazine was in error in certain statements made in the September 1st issue concerning the progress of the Belgo-Canadian Pulp and Paper Company and correction is gladly made.

Officials of the company state that the work on the sulphite digesters has not been stopped, as this magazine stated, but is keeping on nicely, and the company will be in a position to deliver sulphite in the early part of November. Following the completion of the sulphite plant, work will go ahead on the installation of the new paper machine, which will not be held up for a lengthy period as reported.

Mr. Biermans, the General Manager of the company, has now returned from Europe, and is actively engaged in the affairs of his concern.

IN FINLAND.

A correspondent reports that most pulp, paper and saw mills in Finland are shut down, all the largest having been closed for two weeks at time of writing (Aug. 28th) on account of lack of raw material and stoppage of sea export, no boats leaving the country. Good order, however, prevails.

EFFECTS OF VARYING CERTAIN COOKING CONDITIONS IN PRODUCING SODA PULP FROM ASPEN^{*1}

By HENRY E. SURFACE

Engineer in Forest Products, Forest Products Laboratory, U. S. Department of Agriculture.

(As noted in the last issue of Pulp and Paper Magazine experiments of soda pulp have been in progress in the United States Forest Products Laboratories. The bulletin of Mr. Surface on the subject will be published in these columns in two installments).

Reference Notes on page 568).

At the present time practically all of the soft, easy-bleaching pulps used for the manufacture of high-class book, magazine, general printing and the cheaper writing papers are made by the soda process. In England such pulps are produced from esparto (alfa, or Spanish grass); in America, from the poplars and similar woods. Although the soda process of wood-pulp manufacture is not employed commercially to so great an extent in America as the sulphite and mechanical processes, it is remarkably well adapted for producing pulp fibres from any kind of wood or other fibrous vegetable material, no matter how resistant to chemical attack it may be. For this reason it is much used in the experimental work of the Forest Service.

To insure that a wood has been subjected to the most favorable cooking conditions it is necessary to cook it under many different conditions produced by varying such factors as the amount and concentration of the cooking chemical and the duration and temperature of cooking. While the general effect of using greater or less severity of cooking is well recognized in mill practice, there has been almost no available information on the quantitative effects of the individual factors concerned nor on the limitations within which such effects are exerted. Such meager information as may be found in the literature is widely scattered and is not strictly applicable to manufacturing conditions. Notwithstanding modern improvements and the general tendency toward more efficient operations in commercial plants, the most economical production apparently is not being attained by all of the soda-pulp mills. This is indicated by the fact that some of them are using from 10 to 20 per cent more pulp wood, from 50 to 100 per cent more chemicals, and from 10 to 40 per cent more steam, and require much larger plants and more labor for the same tonnage output per day than others making similar products. It was to secure and make available detailed information which would both facilitate other experimental work in the laboratory and promote the efficiency of commercial plants employing the soda process that the series of tests discussed in this bulletin was undertaken. They were carried out at the Forest Products Laboratory maintained by the Forest Service at Madison, Wis., in co-operation with the University of Wisconsin.

The report of the experimental work is prefaced by a short description of the soda process and a review of previous investigations. Some general comments on aspen as a raw material for soda pulp and on the pulp itself will be treated in a later issue. This

species of poplar was selected as the test material because it is the most important soda pulpwood. The information secured however, is of much value also in connection with the cooking of other woods.

The Soda Process and Its Application.

What is here referred to as the soda process may be considered as a modification of the old Watt and Burgess process, first practiced in 1853,² and probably the oldest commercial method for producing chemical pulp from wood. It originally consisted in digesting suitably prepared wood in a large boiler with a strong solution of caustic soda under a pressure of about 90 pounds per square inch for 10 or 12 hours. The wood was then washed to remove the alkali and treated with chlorine gas or an oxygenous compound of chlorine. The partially digested wood was then washed to free it from the hydrochloric acid formed and again treated with a small quantity of caustic soda solution. The pulp so produced was then washed, bleached and beaten in a beating engine, after which it was ready for the paper machine. The modification of this process as employed at the present time in the United States dispenses with the intermediate digestion treatment with chlorine compounds. Different cooking conditions are also used, the details of which, together with a brief description of the manner of preparing the wood are given below.

While a few mills cook their wood unbarked or only partly barked, the general practice is to remove even the live inner bark.³ The barked or peeled wood is then cut diagonally with the grain into slices or chips about one-half to three-fourths inch thick by means of a machine called a "chipper." These pieces are then further broken up by means of a disintegrator, or "shredder," and the resulting chips are conveyed to storage bins, usually above the digesters. An intermediate screening operation to remove dust and dirt and to secure uniform chips is sometimes given them.

On account of the strong solvent power of the cooking liquors used in the soda process it is not necessary to remove completely the knots or decayed portions of the wood. At some mills, however, the chips before being stored are sorted into different grades from which different qualities of pulp are produced. In the case of peeled wood, delivered as such to the mill, the outer shavings, if the wood is cleaned, are kept by themselves and converted into a lower-grade product. In some of the older mills the knots were removed from the peeled logs with a boring machine; and later the chips were picked over by hand. Such procedures, however, have now been practically abandoned in America.

The digesters used in soda-pulp making are either rotary or stationary, and may be either cylindrical or spherical in shape. The present tendency in new installations is towards stationary, vertical, cylindrical

cal digesters heated by live steam which enters at the bottom of the digester in such a manner as to carry the cooking liquor through a pipe to the top of the vessel and spray it over the chips. This insures good circulation. The chips and cooking liquors are charged through a manhole at the top of the digester, the bottom of which is provided with a "blow off" pipe and valve for discharging the pulp after the cooking is complete. Such digesters are from 15 to 50 feet high by from 4 to 9 feet in diameter. The larger sizes have been lately introduced; in the past the most common size held about one cord of wood and was 16 feet high by 5 feet in diameter. At the time of the 1905 census the average American digester produced about 1 ton of pulp per cook, and the total combined capacity of the 208 soda digesters in operation then was 222 tons of pulp per cook.

As soon as the charging of chips and caustic soda cooking liquor is complete, steam is turned into the digester until a certain cooking pressure or temperature is reached. This temperature varies at different mills, but one corresponding to 110 pounds steam pressure per sq. in. is probably the most common at present. The pressure is continued from three to eight hours or more.⁴

Washing of Pulps and Recovery of Cooking Chemicals.

After the digestion process is completed the pulp in the digester is generally forced out under pressure or "blown" through a pipe connected with the bottom of the digester into a "blowpit" or "balloon"; whence it is transferred to large washing pans. Here it is drained as free as possible from the strong spent cooking liquors, called "black liquors," and washed thoroughly, first with hot, weak, black liquors from the last washings of previous cooks, and lastly with fresh hot water. The first drainings and washings which contain the greater part of the alkali cooking chemicals are run to evaporators, concentrated, and later calcined in furnaces. The burned ash, called "black ash," is leached in water, and the alkali in the form of sodium carbonate is dissolved. The resulting solution is treated with quicklime (CaO), which changes the carbonate into caustic soda. Modern practice recovers from 88 to 92 per cent of the alkali charged into the digesters. By properly controlling the strength of the black ash solution and mixing various strengths of recausticized solutions, a caustic soda liquor of the desired strength for cooking is prepared.⁵

Treatments Given the Soda Pulp.

After the pulp has been thoroughly washed it is diluted with a large amount of water and screened to remove uncooked portions. This is accomplished by either flat plate, diaphragm screens, or by such screens in conjunction with centrifugal ones. In the case of aspen or poplar the greater proportion of the water in the pulp is then removed by means of "slushers," "feltless wet machines," or "deckers." The pulp is then treated in a suitable vessel with bleaching powder solution, and afterwards thoroughly washed. Very little aspen or poplar pulp is left in the unbleached state, but is usually bleached immediately after it is screened. Those mills making both pulp and paper generally carry the bleached wet pulp directly through the subsequent paper-making operation; but if the pulp is to be sold or stored it is simply run over a paper machine into rolls of dry pulp (about 10 per cent water).

Previous Investigations.

The treatises by Cross and Bevan⁶ and by Schwalbe⁷ and the recent experiments⁸ by Viewig, Miller-Moskan, Miller, Schwalbe, and Schwalbe and Robinoff give much information on the nature of the chemical reactions which take place between caustic soda and cellulose under various conditions, and on the formation of decomposition, mercerization, and other similar products from cellulose.

While the manufacturer of paper pulp is interested in these chemical investigations they do not give him much practical information on the inter-relation of the various cooking conditions which he employs and the effect of their modifications on the yield and quality of the pulp.

An article published by Tauss⁹ in 1889, dealing with the effects of water alone on cellulose-containing materials, is of interest in connection with the Forest Service tests because the "yield" or residue with zero caustic soda assists in determining the curve for the effect of amount of caustic soda on the yield of crude pulp (Fig. 4). Tauss's experiments showed (Table 1) that a very appreciable amount of solids can be extracted from wood and from cellulose by boiling in water, especially at high pressures. In 1890 the same author¹⁰ published the results of investigations in which caustic-soda solutions were employed in the place of water alone. The experiments with caustic soda were made partly with solutions of a concentration employed in commercial practice, partly with more concentrated, and partly with more dilute solutions. The calculated residues (Table 1) afford some interesting comparisons with the Forest Service yield data.

In 1907 De Cew¹² published a technical article dealing with the function of the soda process in the production of wood cellulose. Although no data are cited to substantiate his conclusions, he makes the following statements:

The results obtained with this process depend very largely upon the accuracy with which it is carried out. The action of caustic soda is one of hydrolysis, in which the woody molecule is gradually broken down with the formation of acid products which combine with and neutralize the alkali, leaving the cellulose in the form of isolated fibres. Now, if sufficient alkali were used and the cooking action continued, the entire fibre would finally be dissolved, although the more resistant celluloses would be the last to disappear. It is, therefore, necessary in order to bring into solution only the lignified portion of the wood to add just sufficient alkali for this purpose.

This is almost entirely neutralized by the acid products formed from the lignocellulose, and thus very little free alkali is left in the liquor to attack the rest of the fibre, which should be almost pure cellulose. At first the alkali is very active and a rapid combination takes place, but the rate of reaction becomes continually slower as the free alkali grows less and the resistance increases. There are also such varying conditions as to causticity, pressure, circulation, and time of cooking, which are of considerable importance in the process, for some makers are obtaining from 1-200 lbs. of fibre per cord more than others in treating the same kind of wood.

In regard to the time required for cooking there is a wide difference in practice. However, the most improved plants are now able to effect the complete resolution of the wood in a very short time. In fact any of the deciduous woods can now be reduced in about four hours. With the improvements in the methods of cooking that have been developed, which en-

TABLE 1.—Effects of boiling with caustic-soda solutions of various strengths and with pure water. (Calculations from Tauss's data.)¹

Material.	Air-dry weight of material treated.	Caustic soda (NaOH) used for each boiling.				Residues from boiling.											
		Strength of solution.		Volume of solution.	Weight per 100 grams of material treated.	Pressure, pounds per square inch.											
						0 (1 atmosphere).					58.8 (5 atmospheres).			132.2 (10 atmospheres).			279.3 (20 atms.).
						1	2	3	4	5	1	2	3	1	2	3	1
		Grams.	Sp. gr.	Grams per liter.	Cc.	Grams.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Purecellulose (Swedish filter paper)	10	1.162	140	500	700	78.12					22.67						
	10	1.090	80	500	400	83.01	78.14	77.21			55.48	46.24	41.98	49.71	43.20	41.02	
	10	1.043	30	500	150	87.93					84.64			79.72			
	20		20	1,000	0	100.00					99.26	98.86	98.61	90.58	86.72	86.52	(4)
Beech wood (fine shavings).....	10	1.162	140	500	709	53.57					8.52						
	10	1.090	80	500	400	58.23	48.10	45.32			35.64	32.77	30.20	24.34	24.02	20.61	
	10	1.043	30	500	150	69.75					44.34			34.41			
	20		20	1,000	0	96.20	94.00	92.75			78.40	74.40	73.15	68.32	62.20	61.59	(5)
Pine wood (fine shavings).....	10	1.162	140	500	700	64.55					2.87						
	10	1.090	80	500	400	66.11	59.26	54.80	51.57	48.63	43.09	32.53	24.15	25.68	21.11	18.20	
	10	1.043	30	500	150	71.63					49.04			29.69			
	20		20	1,000	0	98.82					84.60	81.53	80.82	88.22	85.10	83.90	

¹ Tauss states his results as parts of extracted matter per 100 parts of air-dry material. The percentages shown in this table were calculated by subtracting Tauss's values from 100. Hence the residues as calculated are subject to errors due to lack of a common moisture basis for the extracts and original material, and to losses of volatile matter. The calculated residues, although not strictly accurate, are comparable with each other.

² The solutions containing zero grammes per liter of caustic soda consist of pure water only.

³ A jelly-like hydrocellulose was obtained.

⁴ No explanation has been given as to why extractions at 10 atmospheres pressure should leave greater residues than extractions at 5 atmospheres pressure.

⁵ No hydrocellulose was observed.

Note—The numerals at the top of columns signify the serial number of the successive boilings given the same sample of material. In each case the material was boiled for three hours with fresh solution or water.

able us to get about twice the work out of a digester that was formerly obtained, a number of special advantages have been found to be the result of these quick cooks. The shorter the time the alkali is in contact with the cellulose, the higher is the yield obtained and the sounder and stronger is the fibre. If all of the cellulose is freed from the lignin at practically the same time, the free alkali will have very little time to react on the weaker celluloses and the fibres will not be broken nor the points and serrations dissolved. Moreover, the fibres from the short cook are not hard to bleach, because the character of the cellulose is uniform. Under conditions of complete saturation with the right proportion of alkali, the lignocelluloses can be almost instantly dissolved by subjecting the materials to the temperature and pressure that is ordinarily used for cooking the fibre. The writer has performed this experiment on a laboratory scale, and the fibre obtained so closely resembled the actual structure of the woody cell that hardly any cellulose could have been dissolved.

Clapperton,¹³ in 1907, in writing about the soda process, says:

It is the necessity for employing such high temperatures and pressures (90 pounds per square inch) that constitutes the serious drawback to the alkali process, as under the conditions of boiling the strong caustic soda acts on the cellulose, impairing the strength and reducing the yield.¹⁴ The reason why such conditions are necessary is that the soluble acid bodies resolved by the caustic become so oxidized and condensed that they counteract and weaken the reducing action of the soda, and in order to equalize their resistance higher temperatures and pressures have to be employed.

Beveridge¹⁵ recently published the results of some of his experiments on the effects of varying the cooking

conditions in the production of esparto pulp. He says:

The treatment of esparto by the soda method is typical of the preparation of paper pulp from nearly all fibre-yielding plants, such as bamboo, straw, wood, etc. The isolation of cellulose is brought about by digesting the prepared plant in an alkaline solution, having for its base caustic soda, at variable temperatures and under variable lengths of time. The chemical reaction which takes place during this digesting process is not known; that is to say, has not been isolated because of the complicated character of the encrusting substances surrounding the fibre in the plant. The caustic soda in aqueous solution forms soluble compounds with these encrusting bodies and dissolves any silica which forms a part of the plant's structure, so that by subsequent draining, washing and bleaching the liberated cellulose is obtained in a comparatively pure state. Cellulose from whatever source it is obtained is, however, soluble in aqueous solutions of caustic soda. Moreover, the solvent action of the caus-

TABLE 2.—Experiments regarding yield of air-dry bleached pulp from Oran esparto.

No. of experiment.	Esparto, weight taken.	Soda liquor.		Conditions of boiling.			Weight of air-dry pulp.	Dry pulp on dry esparto.	Bleaching powder.
		Volume.	Na ₂ O.	Time.	Temperature.	Pressure.			
	Grams.	Cc.	Per cent.	Hours.	°C.	Lbs.	Grams.	Per cent.	Per cent.
1.....	200	800	1.58	3	142	55	87.30	43.91	29.5
2.....	200	800	2.13	3	142	55	80.67	40.55	13.5
3.....	200	800	2.69	3	142	55	72.00	36.20	10.5

Note—The different trials were made in wrought-iron tubes fitted with screw caps, all three being heated together in an oil bath for three hours at a temperature of 302 deg. F. (55 pounds above atmosphere.)

tie is accelerated by heat and by the length of time (within limits) in which the two bodies are heated together. It is therefore apparent that if the maximum yield of cellulose is desired when using this method due regard must be paid to the laws regulating the yield. These laws may be expressed thus: The yield of cellulose obtained from any plant by the caustic soda method depends upon:

(1) The proportion of caustic soda (NaOH) used per unit weight of plant;

(2) The temperature employed; and

(3) The length of time the digesting operation is continued.

If any one of these conditions be altered and the other two kept constant, the yield varies inversely as the altered condition. Thus, in the case of esparto, the author performed a series of experiments in which the proportion of caustic to unit weight of esparto was varied, whilst the temperature and duration of time of digesting were both kept constant with the following results (Table 2).

The following is taken direct from Cross, Bevan, and Sindall's¹⁶ resume of Beveridge's experimental results, which include the data quoted in Table 2 and others:

He made three sets of trials, as follows:

Constant conditions.

1. Time and strength of caustic.

2. Pressure and time.

3. Pressure and strength of caustic.

Variable.

Pressure varied.

Strength of caustic varied.

Time varied.

The results were:

1. Increase of pressure resulted in a diminution of yield, the quantity of pulp obtained being reduced considerably.

2. Excess of caustic soda caused rapid diminution in the yield of cellulose.

3. Gradual exhaustion of the caustic soda by prolonged digestion prevented such serious diminution of yield.

The discussion and experimental results which have been quoted show in a general way the effects of varying some of the fundamental cooking conditions in the soda process. None of the experiments cited are directly comparable to commercial practice in this country, because the testing conditions were not sufficiently representative of manufacturing conditions, and, in the case of Beveridge's experiments, because esparto—a grass, or pectocellulose—was used as the test material. Moreover, the effects of the cooking conditions employed were not studied in as great detail as seemed desirable. The experiments show very clearly, however, that improper cooking conditions are wasteful or inefficient, and indicate the need for complete experimental data on which improvements in commercial practice may be based.

Method of Conducting Experiments.

Scope and Plan of Tests.

Aside from the character of a wood or other material prepared for cooking, the principle cooking conditions affecting yield and properties of pulps, consumption of cooking chemicals, and the general efficiency and costs of the cooking operations are indicated under the following general headings:

(1) Preliminary treatments which may in some cases be given the prepared chips. This includes such

treatments as preliminary pressure, vacuum or steaming.

(2) Character of the cooking apparatus, including size, shape and construction of the digester; manner of heating, whether by saturated or superheated steam turned directly into the digester, or by the use of steam jackets or flue gases; also the degree and kind of mechanical agitation employed, if any.

(3) Proportions of the charges. This covers the amounts of wood and chemicals; also the amounts of water present in the wood and the original cooking solutions, together with the water condensing in the charges from steam used in cooking.

(4) Character of the cooking liquors when charged. Such items as causticity, initial temperature, impurities and concentration are important.

TABLE 3.—Plan of cooking experiments.

Test group.	Number of tests.	Cooking conditions under investigation.			
		Initial concentration of caustic soda in digester liquors. ¹	Amount of caustic soda per 100 pounds of wood. ¹	Maximum cooking temperature (equivalent steam pressure).	Duration of cooking at maximum pressure or temperature.
I.	6	Constant—80 grams per liter.	Variable—from 15 to 40 pounds in steps of 5 pounds each.	Constant—100 pounds per square inch.	Constant—6 hours.
II.	6	Same as Group I....	Constant—25 pounds (value selected from Group I tests as most satisfactory for later tests). Same as Group II....	Same as Group I....	Variable—from 1 to 11 hours in steps of 2 hours each.
III.	6	do.....	do.....	Variable—from 70 to 120 pounds per square inch in steps of 10 pounds each.	Constant—7 hours (value selected from Group II tests as most satisfactory for later tests). Same as Group III.
IV.	4	Variable—from 110 to 50 grams per liter in steps of 20 grams each.	do.....	Constant—100 pounds per square inch (value selected from Group III tests as most satisfactory for later tests).	

¹ In commercial practice it is customary to vary the amount of chemical used and its initial concentration both at the same time when attempting to change the severity of the cooking due to these factors. This results in the volume of the cooking, liquors being kept approximately the same, which is a desirable feature. In these tests, however, it was the intention to find out the effects of each factor separately.

(5) Duration of the cooking treatment. The treatment is in three periods—(a) a period of increasing temperature; (b) a period at maximum temperature; and (c) in some cases, a period of decreasing temperature.

(6) Pressures and temperatures. This considers the pressures and temperatures of the digester contents at different stages of cooking; also the temperature of the digester room (as affecting radiation and condensation).

(7) Manner of admitting steam, "relieving," and "blowing" the digester.

Since the effects of the variable cooking conditions may be modified by the treatments given the pulps after leaving the digester—such as leaching or washing screening and bleaching—these treatments must also be taken into account, for it is not possible to determine all the important effects of the cooking treatments until the finished pulps have been prepared.

The many factors are more or less interdependent, and any change in one results in unavoidable changes in others. Four of the more fundamental of these factors have been investigated in the Forest Service experiments. They are:

(1) Amount of caustic soda charged per pound of wood.

(2) Duration of cooking at maximum temperature.

(3) Maximum temperature (pressure) of cooking.

(4) Initial concentration of the cooking chemicals.

The effect of these four factors upon the yield and properties of the pulp and consumption of cooking chemicals were determined.¹⁷ The tests fall naturally into four groups; in each group all the conditions were held as nearly constant as possible except the factor under investigation, which was varied in successive tests or "cooks" according to a definite plan. The plan of the tests is shown in Table 3. In addition to the factors mentioned in this table all other factors under control were so far as possible held constant. Those for which values were specified are the following:

Amount of chips for each charge, 40 pounds bone-dry weight.

Dryness of chips, air dry.

Causticity of cooking liquor, 95-98 per cent.

Temperature of charging cooking liquor, 22° C. (72° F.)

Temperature of digester room, 22 deg. C. (72 deg. F.)

Duration of cooking before maximum pressure is reached, 1 hour.

Duration of cooling and relieving digester before blowing, 5-10 minutes.

Blowing pressure, 30 pounds per square inch.

Reference Notes.

¹ This paper presents detailed information of value in experimental work in the laboratory and in promoting the efficiency of commercial paper-making plants employing the soda process.

² Charles Watt and Hugh Burgess secured a United States patent on this process in 1854. It was developed further and modified by Juillon in France (1855), by Houghton in England (1857), and by Albert Ungerer, to whom a British patent was issued (1872). Further modifications gradually resulted from its commercial application.

³ The barking loss amounts to about one-fifth of the weight of unbarked logs. The losses in the case of logs from 31 trees used in these experiments varied from 16 to 20 per cent, which checks quite well with Ziegelmeyer's figure of 19.5 per cent on European aspen. (See Stevens, *Paper Mill Chemist*, p. 150, 1908.) Aside from the convenience and ease of barking in the woods, the saving of freight is considerable when the wood is transported to the mills by railroad, and since the barked wood dries out rapidly an additional advantage is secured by the loss of weight in seasoning. A cord of green aspen (about 50 per cent water) weighs about 1,900 pounds more than the same wood air dry (about 15 per cent water).

⁴ The detailed cooking conditions employed at various mills will be treated in another issue.

⁵ A few mills still cling to the older practice of not recovering the alkali from the black liquors. Such mills buy the alkali for cooling in the form of caustic soda (NaOH). The cooking solution is produced by dissolving in water a sufficient quantity of the caustic to give a solution of the desired strength. The black liquors are run to waste, and, although the consumption of cooking chemicals is very high, the mills seem to operate at a profit.

⁶ Cellulose, 1903. Also *Researches on Cellulose*, 1895-1900; 1930-1905; 1905-1910.

⁷ *Die Chemie der Cellulose*, 1910-1912.

⁸ For specific literature references see bibliography in appendix.

⁹ *Dingl. Polytech. J.*, pp. 276-285, vol. 273, 1889; *Jour. Soc. Chem. Ind.*, p. 913, vol. 8, 1 89.

¹⁰ *Ibid.*, pp. 421-423, vol. 2, 6, 1, 90; *Jr. Soc. Chem. Ind.*, p. 833, vol. 9, 1890.

¹² *Jour. Soc. Chem. Ind.*, pp. 561-563, vol. 26, 1907; *Chemical Abstracts*, p. 319, 1908.

¹³ *Practical Paper making*, p. 33, 2d ed., 1907.

¹⁴ In modern commercial practice even higher temperatures and pressures are employed, and the results of the Forest Service tests do not corroborate Clapperton's statements as to the undesirable effects from using them.

¹⁵ *Papermaker's Pocketbook*, p. 72, 2d ed., 1911. See also *Sindall, Manufacture of Paper*, p. 77, 1908.

¹⁶ *Wood Pulp and Its Uses*, p. 132, 1911.

(To be continued)

Ottawa Notes

Ottawa, Ont., September 25. — As a result of an investigation in the city of Hull last week by an inspector of the Quebec Government, the wholesale theft of valuable saw logs and pulpwood belonging to lumber and paper firms on the Ottawa river has been discovered. It is alleged that the stolen logs have been located, cut and piled in cordwood, in the backyards of certain inhabitants of Hull, and it is understood that prosecution will be entered against them.

The logs, which comprise some from the E. B. Eddy, J. R. Booth and Gilmour companies, have been identified by the company marks stamped on the ends of the logs. From the fact that some of the Gilmour firm's logs were found, the authorities think that the thefts have been going on for some length of time and on an organized basis as the parties who took them must have towed them up the river from the Gilmour mills to the places where they were found.

* * *

It is now understood that the reason the Fraser Lumber Company of Deschenes, Que., has deferred the transfer of its big mills at Deschenes to the Hurricanaw district where it owns large limits of saw timber and pulpwood, is the fact that the North Railway Company, which originally intended to construct a line which would have supplied facilities for getting out the lumber from that district, have now dropped the project. It will probably be a long time before any railway will be built in this direction for though the Government announced that it would construct a line to connect Montreal with the National Transcontinental, the war will probably greatly defer the starting of work on this scheme.

* * *

The closing down a month ago of the greater part of activities of the J. R. Booth lumber and paper company has already caused considerable destitution among the families of employees, who form a large part of the citizenship of the city of Hull. As a result a deputation from the Hull city council waited on Mr. Booth a week ago and requested that the mills be operated at full capacity once more if at all possible. They were informed by Mr. Booth that as the company was losing money by its forced inaction every effort would naturally be made to have all the mills running again. However, the water in the Ottawa river is now lower than ever and still dropping. The effect of the breaking of the big Government conservation dam at Lake Temiscaming some months ago is now being keenly felt.

At the Booth plant the paper mills are being reported day and night by steam and the pulpmills are running on partial time but the sawmills are idle.

* * *

The Trade and Commerce Department is making every effort to encourage Canadian paper manufacturers to capture the export trade which Germany loses as a result of the war situation. In a recent bulletin issued to manufacturers the opportunities presented by South American markets were emphasized. The Argentine Republic in 1912 imported \$9,500,000 worth of paper of which about \$2,400,000 came from Germany as compared with but \$600 from Canada. Argentine obtains practically all its printing paper, about \$900,000 worth, from Germany; paper board, \$300,000; writing paper, \$200,000; news print, \$600,000, etc., Germany also exported woodpulp of a

value of \$100 000 to Argentine. Brazil imports paper to the amount of \$2,500 000 annually from Germany.

It is recognized however that an even readier market is that of Great Britain. The Trade and Commerce Department announces that many inquiries have already been received from England for Canadian pulp and paper and already a number of English paper

dealers have arrived in the Dominion to place orders. It is understood that Canadian writing papers of the lighter class are particularly desired and that Canadian office papers will also be in considerable demand. The market for news print of course, will always be first while the war lasts with its demand for newspaper extras.

A COMBINATION WATER SOFTENER AND STORAGE TANK

With the water problem ranking among the very highest in importance in those of the manufacturer, the development of new methods of preparing water for use in boilers is of the greatest import. L. M. Booth, writing in the *Journal of Industrial and Engineering Chemistry*, sets forth some points which mean much to the paper maker.

Any water purification process implies, says Mr. Booth, that the purified water is to be used. How best to store this water between the time it is purified and used is a matter for consideration. In some industrial plants, the rate of use of water is fairly constant throughout the day, the water is used as fast as it is softened and no storage is necessary. Most water users, however, have one or more considerable peaks in their load requiring the delivery of large volumes of purified water during a short space of time. The usual plan has been to provide a separate tank or reservoir.

During the past ten years a great many softeners equipped with excelsior filters, affording storage capacity for one hour's flow (more or less)—sufficient for ordinary requirements of an industrial or power plant—have been built. Usually, this storage capacity is provided by increasing the height of the tanks a few feet above the filter to gain the desired volume. A softener arranged to include storage capacity above the filter is shown in Fig. 1.

This provision for storage capacity, while adequate to serve the needs of most power plants, necessitates the use of raw water for, perhaps, half a day, twice each year, in order to provide opportunity to change the filtering material. To use raw water, pumped directly to the feed water heater for boiler feed, for such a brief interval, is not especially objectionable. For railway water stations, however, such a plan has very little to commend it, because during periods of filter cleaning, there would be no water available, stored at sufficient height, to fill a locomotive tender in the usual short period.

The best water softening practice in vogue at the time the first modern water softeners were imported from Europe, late in the nineteenth century, called for the use of filters to clarify the imperfectly settled water. Usually, these filters were constructed of "excelsior" (wood shavings). Careful observations of softeners operated at a small fraction of the rated capacity—corresponding to more liberal design—readily demonstrated that if the rate of upflow in the settling space were restricted to a very slow flow, practically no suspended matter reached the filter. By gradually adopting more liberal standards of settling tank design, the point is soon reached when the expense of installing and maintaining a filter for purifying boiler feed water is not justified. After demon-

strating that the filter is not an essential feature of water softener construction, it becomes a simple problem to add any reasonable amount of pure water storage.

As a result of several years practical experience and study, having in mind the possible elimination of the filter, the softener at the foundry of the National Malleable Castings Company, Toledo, Ohio, as shown in Figs. 2 and 3, was designed and installed to soften and clarify hard and sewage laden muddy Maumee River water for boiler feed.

More rapid progress toward development of the "No-Filter" softener for purifying boiler feed water would have been possible except for the prejudice favoring the use of a filter of some kind. The average individual cannot conceive how it would be possible to simplify and improve a softener by omitting the filter. Several of these "No-Filter" installations having been made, and having demonstrated their fitness to meet the requirements, the construction of a "No-Filter" softener equipped to store purified water, has become a commercial proposition. A typical installation of this kind is shown in Fig. 4.

Somewhat more than the upper half of this tank, which is 40 feet high, is devoted to the storage of softened water. Fig. 5 shows the general arrangement of this softener.

The water enters at the inlet and passes to an over-shot water-wheel which furnishes the power to drive the agitator in the softening tank, as well as the agitator in the chemical tank at ground level. This same power also operates the chemical feed pumps. One of these pumps delivers the chemical solution to the chemical regulator located on the chemical tank, and the other elevates the solution which has been measured by the chemical regulator, to the top of the softening tank, where it meets the raw water which has passed over the waterwheel.

The downflowing water and chemicals are thoroughly mixed in this softening tank, during a period of twenty-eight to forty-eight minutes, depending on the amount of water in the storage space. When operated at less than the rated capacity of 50,000 gallons per hour, the time of flow is proportionately longer. The action of the softening tank mechanical agitators in preparing the precipitate for sedimentation is described below and is shown in Figs 7 and 8.

From the softening tank the water flows upward through the settling space at a rate of 3.61 feet per hour, which is sufficiently slow to effect clarification of this particular water. The time of flow from the bottom of the softening tank to the outlet corresponds to 4.4 hours when the softener is operated at rated capacity.

There is available for immediate use 308,000 gallons of softened water above the outlet. This volume is sufficient to meet the demands of a large locomotive terminal and freight yard.

Fig. 6 shows in detail the manner of handling the chemical solution. The reagents used are hydrated lime and soda ash.

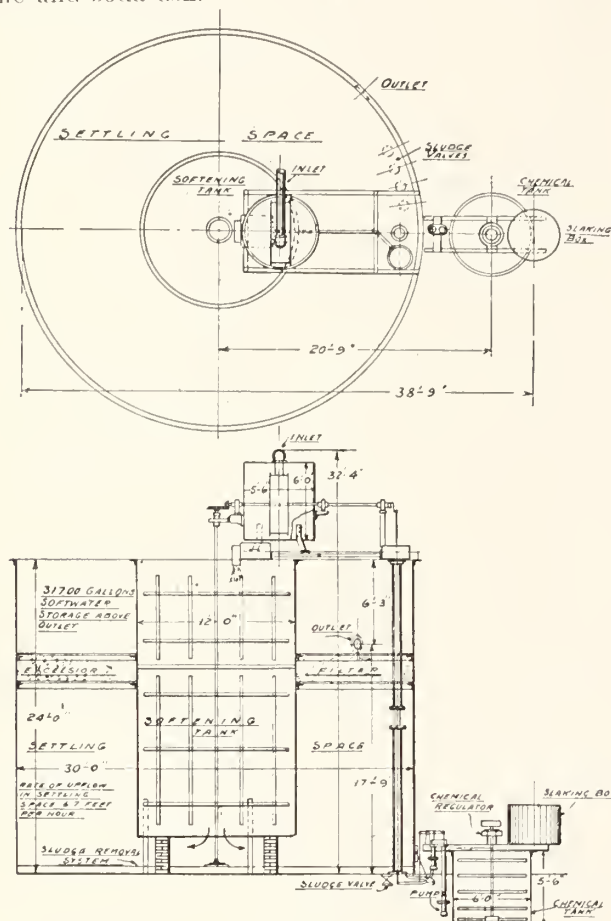


Fig. 1.

The low lift pump takes its suction through a strainer screen near bottom of chemical solution tank. The solution is delivered to the inlet compartment of the chemical regulator, mounted on the chemical tank. The level of the solution in this compartment is maintained at constant height, for the reason that sufficient solution is delivered into it to keep the solution continually overflowing the inner weir. The excess solution returns to the chemical tank. A uniform flow of solution, sufficient to treat 50,000 gallons of water per hour, from the inlet compartment flows through the standard orifices, which are always under a constant head. When the softener is run at full capacity, all of this solution is required; but if, for instance, it is operating at one-half capacity, as shown in the detail view of the chemical regulator, only one-half of the maximum flow of solution passes down the feed chute to the high lift pump, by means of which it is delivered to the softening tank. The other fifty per cent, which passes the cut-off plate on the other side, returns directly to the chemical tank. Similarly the feed is directly proportional to the amount of water entering the softener for all other rates of flow. The chemical regulator cut-off plate is actuated and controlled by a float riding in a tank supplied with water which has passed over the waterwheel. The varying heights of water in the lower part of the wheel box are transmitted to the float tank through an equalizing pipe.

The outlet for the hard water from the wheel box, into the softening tank is through a Sutro weir, the general shape of which is shown in the detailed view. The extreme width of this weir opening is 25 inches. In view of the fact that the height of the water flowing through the Sutro weir is at all times directly proportional to the quantity, it will be seen that the vertical movements of the regulating float are always proportional to the quantity of water flowing. The vertical movements of this float are transmitted by means of a lever, links, and bell crank to the cut-off plate of the chemical regulator, and thus control the proportional feeding of the chemical solution.

Aside from a liberal design of settling tanks, there is one other important feature of this type of softener which materially assists the settling tank to deliver clear water. This is the provision for mechanical agitation in the softening tank. The agitation is continued sufficiently long not only to thoroughly distribute and mix the chemicals with the water, but also to insure coagulation of the precipitate, so that it will settle promptly as soon as the quiet condition of the settling tank is met.

Fig. VII. is an example of the influence of mechanical agitation as compared with another softening experiment similar in all respects with the exception that only a slight mixing was given in VIII-B., the "unstirred," whereas, VIII-A had been subjected to the kind of agitation which experience has shown to be the most sufficient for precipitates of this kind.

The photograph (Fig. 7) was taken at the end of three minutes following the addition of chemicals at the rate of 1.9 lbs. of lime and 1.2 lbs. of soda ash per thousand gallons. The raw water in this case had a hardness of 285, and an alkalinity of 235 parts per million, corresponding in grains per U.S. gallon to 16.6 and 13.7, respectively.



Fig. 2

In the experiment with Sample B there was only a slight mixing of the water caused by eight revolutions of the agitator whereas Sample A was stirred for three minutes, at the end of which time the precipitate had become fairly well coagulated. The slight blur in Sample A shows that while the stirring had ceased, the precipitate had not yet come to rest.

Fig. 8 shows the same samples, neither of which

has been touched since the first photograph was taken. The second photograph shows the difference at the end of six minutes, by which time the precipitate in Sample A had almost completely settled, whereas Sample B as may be noted, shows its precipitate to be very much behind in development.

These simple experiments demonstrate clearly the

advantage gained by the proper kind of mechanical agitation while the precipitate is in process of formation. As already stated, the use of mechanical agitation plays an important role in the "No-Filter" softener, which makes feasible the storage of a large volume of softened water in the same unit with the softener.

Some of the advantages of this softener are:—

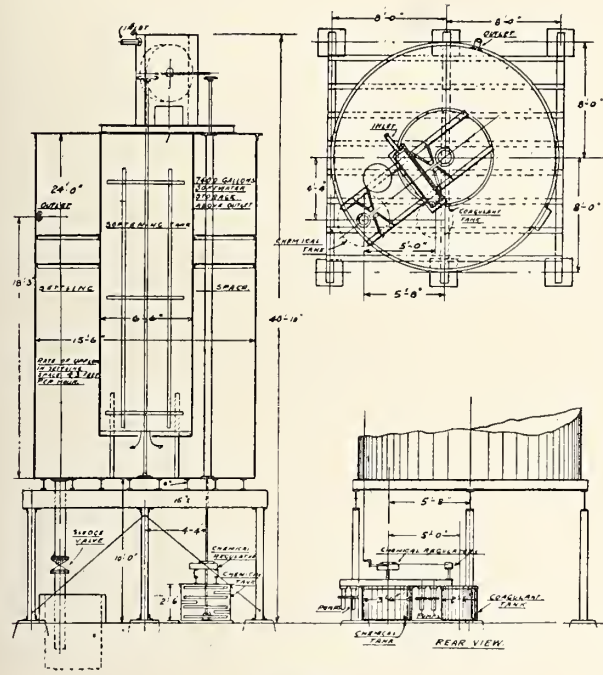


Fig. 3.



Fig. 4.

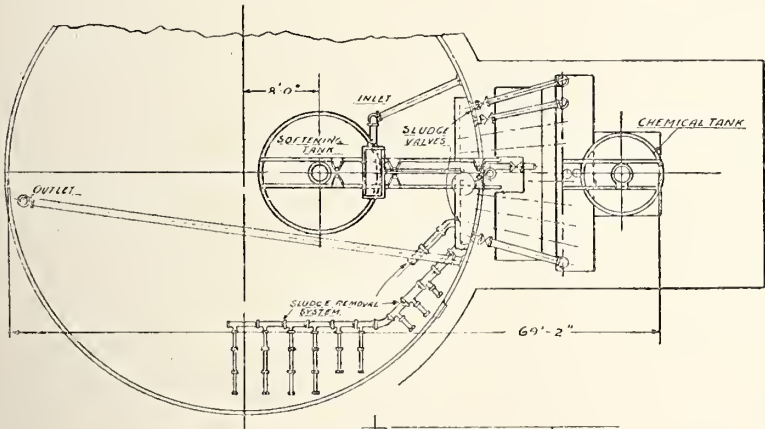
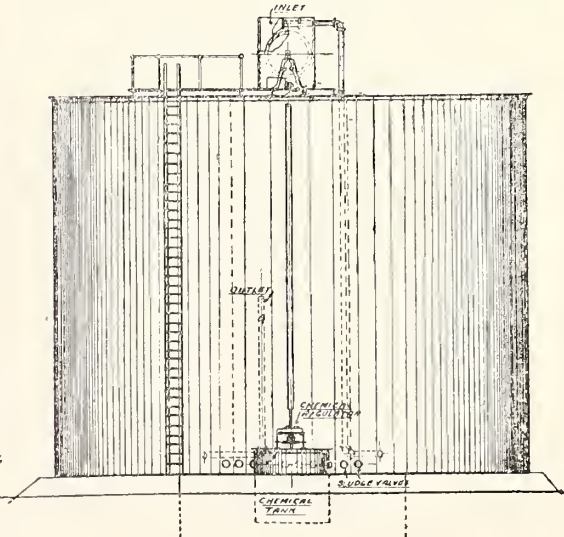
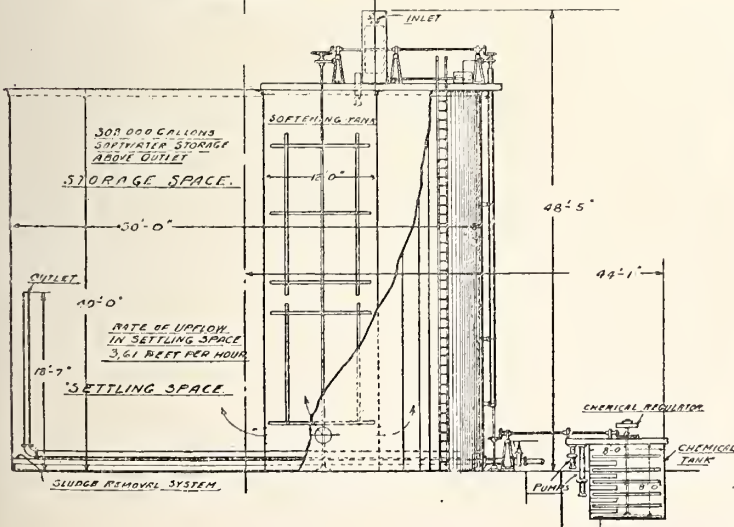


Fig. 5.



1.—All handling and regulation of chemicals is accomplished at ground level.

2.—Mechanical agitation for the softening tank is provided.

The combination of the softening and storage features results in a saving of ground space as well as in cost of the plant. No separate foundation is necessary. It is an important advantage that the water is

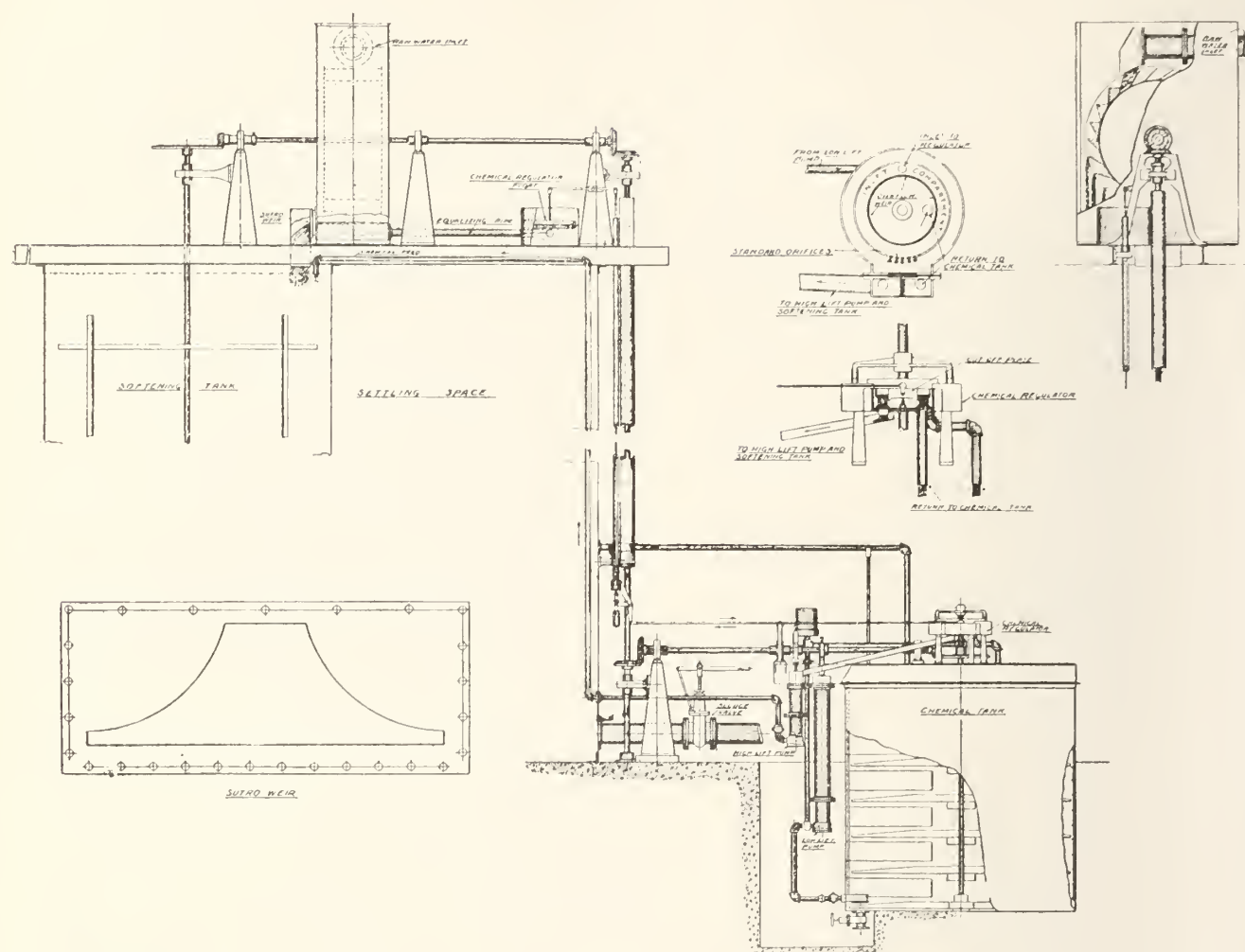
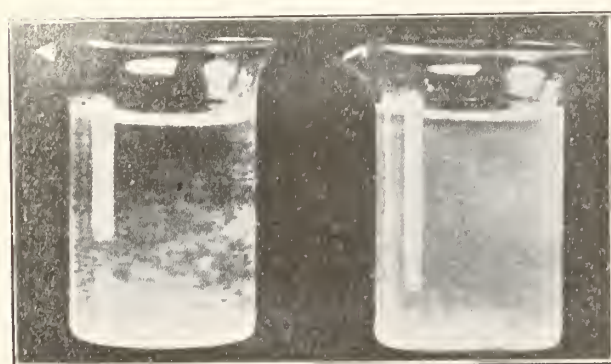


Fig. 6.



A.

Fig. 7.

B.



A.

Fig. 8.

B.

3.—There is sufficiently slow upward flow in the settling space to deliver a clear effluent.

4.—Convenient arrangement of storage capacity.

stored at a considerable elevation suitable for delivery, without pumping, to feed water heater or locomotive tender.

THE CAUSE OF ROSIN BLEMISHES IN PAPER

By Prof. Dr. CARL G. SCHWALBE, Eberswalde, Germany.

In an address by Prof. Dr. Carl G. Schwalbe delivered before the German Association of Pulp and Paper Chemists last June, which is reproduced in the "Wochenblatt für Papierfabrikation" for August 1, 1914, there are described the results of an investigation of the cause of rosin spots in paper and their avoidance. The investigation was very thorough, rosin and its transformations in all stages of cellulose manufacture, from the wood to the finished sulphite pulp, being made the subject of study under Professor Schwalbe's direction.—The whole is reproduced in a current issue of "Paper."

* * *

In studying the wood rosins it was necessary to differentiate between the rosin of well stored pulpwood and the rosin of freshly cut wood. The latter might differ materially from the former in its properties and it was also of great interest to know the changes occurring in entirely fresh wood rosin during storage. At Professor Schwalbe's request the government authorities had spruce and pine wood specially cut for these observations at the end of January of the present year. The wood was conveyed, immediately after cutting, to the Sandow paper and pulp mill, where the firm of Paul Steinbock, of Frankfurt-on-the-Oder, courteously had it barked and reduced to chips at once, so that the investigation could be started within five days after the felling of the timber.

We will first deal with the results of the investigation of rosin in well seasoned wood. Spruce yielded about 1 per cent, pine 2.54 per cent of substance soluble in ether and alcohol. We are, however, not justified in classifying these summarily as rosin, for they contain not less than 50 per cent of fat. It was known previously this rosin must be mixed with some fat from the cellulose contents, but it was astonishing to find so large a volume of fat. This fat differed conspicuously from the oleic acid which is combined with glycerine, but it gave the characteristic reaction for linoleic acid, a discovery similar to that made known by Bergstrom in the combination of what is known as "talloil," the oily substance separated from the waste liquors of soda cellulose. The rosin contained in the rosin-fat mixture closely resembles the ordinary rosin, and the mixture is soluble in petroleum ether, to the extent of about 60 per cent. This portion appears, as will later be shown, to be the injurious element which is responsible for the rosin spots.

The rosin-fat mixture soluble in ether or petroleum is distinguished physically by its fatty oil appearance. The fat it contains is the cause of this general condition, for if rosin and fat are separated we obtain only fat and a brittle, hard rosin.

According to other authorities, turpentine is an important component of wood rosin. In the tests for turpentine it was determined that neither by steam distillation nor by vacuum distillation could turpentine be extracted from the seasoned wood; nor could it be extracted from spruce or pine. However, as a result of alkaline cooking, pine yielded small quantities of turpentine, a discovery to which we shall later refer in discussing the rosin of freshly cut wood.

If the wood rosin is exposed to a prolonged drying, say, for 150 hours, it undergoes only insignificant transformations, nor are important transformations effected by exposure to the effects of dilute chlorine, ni-

trous oxide or ammonia. Consequently the rosin-fat mixture in normally seasoned wood has in the main reached a permanent condition.

If, however, the properties of a rosin-fat mixture obtained from a quite freshly felled wood are compared with the wood rosin previously described, the quality will be found to differ. Perfectly fresh wood rosin is obtained from spruce to the amount of 1.6 per cent, as compared with 0.98 per cent from seasoned wood, for the fir the corresponding figures are 4.9 as against 2.54 per cent. The extreme solubility in petroleum ether of fresh rosin—90 per cent as compared with 68 per cent—is also notable, the high iodine figure being likewise characteristic. The transformation of the fresh rosin, when the wood is reduced to the form of chips, proceeds with remarkable rapidity. The wood is stored in the open, being protected only against rain or snowfalls at night, and it necessary during the day time. After twenty-four hours, three, ten, and seventeen days rosin extracts were made and investigated. After seventeen days the permanent constituents approximated those of well seasoned wood. In the form of chips, there is attained in two to three weeks a seasoning effect which in the log form would require about two years. These chemical transformations of the fresh wood rosin indicate certain physical changes. The rosin-fat mixture becomes more viscid, hardens gradually, a condition that occurs more readily in spruce than in pine.

The behaviour of the freshly felled wood in the examination for turpentine is somewhat remarkable. Thus the presence of turpentine could not be demonstrated in ether extract, though turpentine is readily soluble in ether; on the other hand, turpentine could be separated by alkaline cooking at 170 deg. to 180 deg. C. and a pressure of seven to eight atmospheres to the extent of 0.1 from fresh spruce and 0.8 per cent from fresh pine. This confirms experience in practice, that turpentine cannot be driven off under 170 deg. C. This temperature is necessary, though turpentine in itself is volatilized with steam. We must therefore believe that turpentine can only be expelled from wood at this high temperature and pressure, and in presence of alkali. This is confirmed by the fact that from wood that has already been exhaustively extracted with ether turpentine may still be obtained by alkali-pressure cooking.

Subsequent research concerned the behaviour of the rosin during the digesting process. The question as to whether resin was dissolved at any stage of this process had to be determined. The incentive to this investigation was furnished by the claims of an American patent granted to one Clark, according to which, at a certain stage of the cooking, the upper strata of lye in the digester is richer in rosin than the lower, bottom strata, so that by a part discharge of the boiling lye it is possible to remove a large share of the rosin. In the tests, undertaken in small, experimental digesters, an enrichment of the lye could not be detected. It is true that the discharge of the lye by layers could not be accomplished with these digesters and it was necessary at certain periods to completely interrupt the cooking and test the lye as to its rosin content. Five cookings of one, three, five, seven, and nine hours' duration were made. In the three, four, and five-hour cooking, an insignificant increase in the am-

out of rosin in solution was observed, the greatest volume of this dissolved rosin amounting to only 10 per cent of the rosin contained in the wood. The experiments showed that it was hardly probable rosin was rendered soluble or even emulsified by the sugar or other colloidal substances in solution. Complete assurance could only be obtained by continuous investigation for rosin in a large digester, with liquor taken from various depths.

The result of the experiments here outlined confirms the statement generally made that sulphite liquor contains scarcely any rosin, the rosin of the wood being bound up in the pulp to the extent of about 50 per cent; what remains appears to be changed into substances soluble in water that can no longer be extracted by ether or other organic solvents. If the average quantity of rosin-fat contained in spruce is calculated at about 1 per cent, and that in the finished pulp at 1 per cent, half of the resin must have disappeared in the lye, otherwise the cellulose must contain 2 per cent of ether-alcohol soluble substances. It is premised here that only 50 per cent of the wood is converted into cellulose.

In the preparation of cellulose a portion of the rosin contained in it is separated. Thanks to the kindness of the Norddeutschen Cellulosefabrik, it was possible to obtain what is known as "screen-rosin" taken from the screens of the draining machines. This rosin proved to be almost wholly soluble in ether. The portion soluble in petroleum ether was similar to the portion of wood rosin soluble in petroleum ether, if not identically the same. As, however, it is the screen rosin that is indisputably the cause of the rosin spots occurring in the finished paper, the conclusion already reached, that it is the portion of the rosin-fat combination that is soluble in petroleum ether that constitutes its injurious factor, is quite justified. In comparison with the wood rosin, the screen rosin is somewhat richer in fat. The fat contains notable amounts of oleic acid. Linoleic acid appears to be no longer present, as in the wood rosin. The amount of fat contained in the cellulose rosin is most notable, constituting as it does 60 to 70 per cent of its bulk.

Concerning cellulose rosin a great deal has been published, at least as regards the quantity of the so-called rosin, which according to older statements was put at 0.5 per cent. Later determinations, made with about fifty specimens of cellulose, prove that about 1 per cent must be taken as the average contents. The resin contained in cellulose is subject to a certain transformation on keeping in storage. The solubility of the rosin in ether becomes less, the iodine figure also declines, while its solubility in petroleum is also lessened.

The cause of rosin troubles is to be sought, according to these investigations, in the components of cellulose soluble in petroleum ether and principally in the fat present. This view was confirmed experimentally when in comparative tests with rosin and fat and mixtures of both in the formation of rosin blemishes in paper it was found that rosin alone produced no spots, that fat caused only slightly visible spots, whereas a mixture of rosin and fat resulted in typical rosin blemishes. The experiments were made with alkaline emulsions of the rosins, etc. They were thoroughly shaken up with paper pulp with the addition of solution of calcium chloride. By this means it was possible to effect a salting out of the rosin. The fatty oil made the brittle rosin plastic so that with other rosin particles it combined into large lumps which were then visible in the paper as resin spots. In summer this

rosin-fat mixture is more plastic and more adhesive than in winter, consequently rosin troubles occur more frequently in summer when the air and water are warm.

How can these rosin spots be avoided? The most radical remedy would be the elimination of the rosin from the wood. In the patent records we frequently encounter the proposition that the rosin should be previously extracted from the wood with the aid of organic solvents. If, however, the quantity of required solvent for its complete recovery is considered and the danger from fire, it will be evident that such an extraction would pay only in the event of great richness in rosin. The loss in extractives in the case of alkaline emulsifiers such as caustic soda, ammonia, etc., would also be a serious consideration. This process becomes impracticable when it is understood that it calls for the heating of large quantities of fluid and the recovery of rosin from solutions containing very little rosin, while precipitation with acids is hardly possible.

Under the circumstances here set forth, the customary seasoning of the wood appears to be the most economical means. The only question is whether we cannot advantageously substitute for years of seasoning in the log storage of the wood for several weeks in the form of chips, bearing in mind the above discovered very rapid oxidation, possibly hot air, very dilute chlorine gas or also dilute nitrous oxide, might be employed on the wood. These auxiliary agencies have, however no effect on wood that has been stored for any length of time.

In view of the insolubility of rosin in sulphite liquor, the prospect of being able to get rid of the rosin during the cooking process is not very encouraging.

In counteracting rosin difficulties, the washing of the cellulose while in the digester or in the blow-off vat gives the best results. It is not apparent as to how a reduction in the rosin content can be effected by the rinsing off of cellulose particles, for a complete washing out of the particles is not accomplished owing to the short period of contact between the water and the pulp in the vat. Possibly the following method of looking at it may furnish an explanation. Cold, especially hard water could precipitate glutinous lye compounds on the cellulose particles. The fibres thus rendered adhesive in the subsequent washing attract in the sand traps the rosin particles emulsified in the washing water and contribute in this way to the formation of larger rosin aggregates.

An acid reaction of the washing water operates favorably on the removal of rosin. It is likely that the formation of a fatty line salt, from interaction between the calcium constituents of the water and the free fatty acids of the emulsified rosin fat particles, is the active agent in throwing out rosin.

In addition to mechanical means of removing rosin, as, for example, slices, the removal of rosin from the cellulose by solvent or emulsifying agents suggests itself. The desorinating effect of hot alkaline solutions is well known, but the effect of such alkaline treatment on the character of the cellulose should not be lost sight of. There is, however, a whole series of substances capable of emulsifying rosin and fat. To obtain an insight into the operation of such emulsifying agents, a series of experiments were made with caustic soda, soda, ammonia, soap, tetrapol, and borax. The experiments referred to went to show that soda and caustic soda always worked best, that borax too is good for removing resin without any detrimental action on the cellulose. Tetrapol, a combination of cas-

tor oil, soda soap, and tetrachloride of carbon, while expensive, was effective.

As all these substances are alkaline they cannot be used in chemical pulp plants where the washing water is acid. If, however, the acid is removed their action may be influenced by the hardness of the water. Alkali must therefore be used in larger quantity according to the hardness of the water. An acid-emulsifying agent for the rosin-fat mixture would for that reason be desirable. Little is known of such substances but, in regard to price, what is known as the Twitchell re-agent, a product obtained by the sulphurization of oleic acid and naphthalene, may be considered. Twitchell's re-agent is recognized as an excellent emulsifier of fats. Unfortunately it fails with cellulose rosin, only 41 per cent of the rosin-fat mixture being emulsified and removed by it. The emulsifying agents mentioned were used on cellulose pulp of a density of 7 to 8 per cent in quantities amounting to at most 7 per cent of the weight of cellulose.

It is quite likely that such agents would work well when employed with even higher pulp concentrations either in the kollergang or in the pulp kneader, and so increase the concentrations of the reagents in regard to the volume of water. Such problems can only be solved by experimentation on a large scale, experiments to which the scientific investigations such as here described—above all the knowledge that it is not with rosin only but with rosin-fat combinations that we have to deal—will, it is hoped, furnish the incentive.

Norway and Denmark

A special report on conditions in Norway and Denmark by Mr. C. E. Soutum, Dominion Commercial Agent, throws light upon a most interesting situation. Mr. Soutum says that it was sad tidings also for the Scandinavian pulp and paper manufacturers, when they learned of the outbreak of the European war. Most of them had only very small stocks of coal, and for a start there was no occasion to make shipments, as most of the steamers laid up on account of the great risk of keeping them running.

An almost total closing up of business was in view, but after the first shock every day seems to bring hope for the mills, that they shall be able to keep going without too much restriction, since the supply of coal will again commence. Steamship connection with Great Britain is now considered fairly safe for neutral steamers, and there has been established a special Government insurance for war risk, so the oversea connection is also again coming in fair order.

According to an article in the Norwegian Trade Paper "Farmand" for August 22, the paper, pulp and cellulose mills will therefore be busily engaged in sending forward supplies on running contracts, charging, in case of c.i.f. sales, to the buyers the cost of extra freight and war insurance.

As yet much fresh business has not been done in mechanical wood pulp. While \$10.67 net f.o.b. would be a reasonable price, taking all circumstances into consideration, the majority of the mills who have anything unsold are asking from \$0.53 to \$1.33 more. Twelve dollars is a somewhat stiff price, but it cannot be characterized as unreasonable; there are a few mills, however, who name fancy prices. By doing so they run a risk of missing a good opportunity to obtain a remunerative price for their unsold balances.

There is however, really no over-production; stocks do not accumulate, and the unsold balance of the production of the current year is a small one. Although there is sufficient water in most of the Norwegian rivers (though not in the Drammen river), a great water scarcity in some parts of Sweden is reported, particularly in those districts which ship their pulp over the West Coast or Norwegian ports. It may not be impossible to draw pulp from the Baltic, but shipments from that part will be uncertain, and freights will be high. It ought to be possible to come to an understanding between buyers and sellers under present trying circumstances, if both approach the matter in a reasonable and loyal mood, without trying to overreach each other.

There has been quite a boom in the cellulose market, and prices have advanced from \$8 to \$9.33 per ton. For "easy bleaching" sulphite prices varying from \$45.33 to \$48 net f.o.b. have been paid, and it seems that there are still buyers in England at the highest of these quotations. "Strong" has commanded \$42.67 to \$44.

Some of the North of Sweden mills have stopped already, others are run with reduced output. If these mills cannot get new supplies of coal and sulphur, a general stoppage during the autumn will be inevitable. If prices go sufficiently high, it will, however, be possible for these mills to get supplies through the cities of Trondhjem or Narvik, in Norway, and to ship their produce that way; indeed, it is reported that an offer f.o.b. Narvik has already been made.

A week ago there arrived from Russia what will probably be the last shipment of pulp wood which the Norwegian mills can obtain from there for some time, as export of wood material of all kinds is now prohibited from Russia during the war. This will mean a break-off in the production of those mills that have counted on their supply of raw material from Russia. One mill alone is reported to have orders with Russian exporters for about 12,000 standards, which they now will not receive, and it may be difficult to secure sufficient raw material in a hurry to keep the mills of this company running steadily during the coming months.

Exceptionally low water in the Swedish rivers has for some time made the floating of logs impossible, and of 13,000,000 logs destined for the pulp mills, only 6,000,000 have been floated so far. If there does not soon come abundant rain, the situation for the mills depending on these logs will be critical. Earlier in the summer, when there was plenty of water, the floating was stopped through a strike by the laborers.

The war has already caused the paper prices to go up 60 per cent. Of what importance this is for the paper mills may be understood, when it is stated that the paper export from Norway during the first six months of 1914 reached about 96,000 metric tons. Every week there is now shipped large quantities of paper, especially to England. The question is only how long it will be possible for the mills to get sufficient supply of coal.

The law recently put in force about the insurance of Norwegian vessels against war risk prescribes that the Norwegian Government guarantees 80 per cent of the insurance. The premium is not to exceed 12 per cent per year and $\frac{1}{2}$ per cent of the amount of the insurance. All vessels that are bound to register must insure, with the exception only of such vessels as previously carried insurance against war risk, as long as such insurance is in force, ships in the coast and lake traffic, fishing boats and ships that are laid up in a safe harbor.

THE BRITISH PAPER INDUSTRY AND PULP TRADE

(From Our Own Representative.)

It has required nothing less than the most terrible war that Europe has ever witnessed to lead some of us, lay and technical, to worry our heads about the extent and character of Germany's and Austro-Hungary's foreign trade connections and the need for strong action in order to deal properly with the menace. Yet, while in a trading sense, at any rate, Germany and Austro-Hungary lie hors de combat, we ought to rise to the occasion. British paper manufacturers are moving quickly. What are Canadians doing, and what steps are they taking to expand the interests of the pulp and paper mills? That is a question we must ask ourselves seriously. I see a golden opportunity before Canada and if it is lost now it may never be regained. The British paper manufacturer also sees his opportunity and to enable him to capture German and Austrian markets he has called in the assistance of the Trade Board and all the other departments abutting on to it. Canada must and can do the same. Let it be remembered that this storming of the citadel of German trade by the guns of German militarism has come at a very important juncture in the great industrial movement in Canada in the pulp and paper trades. As I have already explained in previous articles, German mills are shut down and the British Navy is lying off all German ports to see that not an ounce of food, let alone pulp and paper, will be imported or exported. That is the condition of things so long as the war lasts and when hostilities are over German pulp and paper producers cannot pull themselves together for many a year to come. Then as to German and Austrian credit and finance who can predict the position in this connection, and what the effect upon industry may be? There are other important factors which are not to be lost sight of, but the Press Censor has to be considered, and I am forbidden to mention them. The moral of the situation is—there has been enough talking, and the time has now arrived for Canadians both individually, collectively and in co-operation, to resolve to do something to capture some of the trade of our rivals at home or abroad and to show a willingness to adapt ourselves to buyers' requirements, instead of trying to compel him to change his ways for our benefit.

The Paper Industry and Paper Trade.

In the British paper industry there is no sign of a famine as regards pulps, and manufacturers are kept fairly busy considering that the export trade has been somewhat dislocated. So long as the pulp comes in the demand for paper is found to be good and prices have gone up to the extent of 5 and 6 per cent. In the paper trade, that is amongst the jobbers and agents and merchants, things are not so healthy. The war has, of course, killed the business of those who solely represented German and Austrian firms, whilst agents for the Scandinavian mill have had their supplies curtailed, which means reduced profits, but their position is not as bad as one might expect. Agents and merchants representing British, Canadian or American mills are the better off and their only grievance is that they cannot meet the demand. The great rush is on newsprint and fine printing paper, and the supplies so far have been excellent. Some people at first became alarmed when the war broke out, and the opinions of these alarmists were intensified by the notices that appeared in the daily and weekly newspapers. As a mat-

ter of fact, these alarming newspapers had their advertisements stopped and they accordingly cut down the sizes of papers to meet the new conditions. Other periodicals and papers published weekly stopped altogether, not for the want of paper to print on, but for the want of advertising matter to help the revenue in the profit and loss accounts. The excuse then presented to the public was the threatening of a paper famine. Of course, most of the large daily and evening papers in the United Kingdom are conserving their paper supplies and for this they cannot be blamed. But to speak or write of a paper famine is so far a remote turn in forecasting events. Indeed, I was speaking to a large newspaper proprietor some days ago, and he told me that he had just given out a twelve months' contract for newsprint to one of the English mills, and it may be inferred that if the mill could not meet the large demand, the grave risk of signing the contract would never have been undertaken. The mill incurs enormous liability under the contract. Newsprint is now selling at three cents to four cents per pound, but as I have already pointed out, it is an impossibility to say what the consumption is in the United Kingdom and any figures published dealing with the output or consumption, are only the result of an imaginative mind. Mills do not make a report on what they produce for public information, and what comes in and goes out of the country can only be gauged through the government reports. According to these reports the following were the imports and exports:—

August.		
	Cwts.	Cwts.
	1913.	1914.
Imports	1,131,897	630,227
Exports	280,171	223,259

January to August.		
Imports	8,537,967	7,921,584
Exports	2,389,157	2,202,575

On August 4 war was declared, and considering what the country has gone through, these figures are not very disappointing. They include paper and boards, packing paper and so on. A few details as to reel and other paper may be interesting; the figures showing cwts.:

Imports in August.		
	1913.	1914.
Reel paper	294,485	303,157
Unreel	72,155	33,256
Writing paper . . . . .	.....	.....
Printing paper . . . . .	.....	.....
Packing paper	343,732	130,385
Wall papers	1,897	236

Exports in August.		
	1913.	1914.
Reel paper . . . . .	.....	.....
Unreel . . . . .	.....	.....
Writing paper	19,514	14,830
Printing paper	151,407	121,627
Packing paper	76,587	59,821
Wall papers	6,335	4,412

Germany is a large supplier of the foregoing paper to the British markets and the result is the Teutons have been knocked out altogether, in addition to Austria. Some of the German trade in neutral countries is already finding its way into England and Canada would do well to watch all British possessions, like New Zealand, Australia, etc.

Ground Wood and Chemical Pulps.

There is very little new business being transacted in ground wood and chemical wood pulps. Nearly all the mills have very fair stocks of ground wood, and shipments against running contracts are daily arriving, thanks to the British Navy which has already cleared the sea route for shipping purposes. Chemical pulps are also arriving in large quantities, but prices for new parcels are gradually going upon a higher basis and the Swedish and Norwegian mills are doing their best to get record prices. Buyers are consequently holding off. The arrivals of pulps during August, since the war broke out, compared with August 1913, were as follows:—

August.	Tons. 1913.	Tons. 1914.
Chemical Bleached, dry . . .	1,375	1,683
Chemical, Unbleached, dry . . .	32,360	16,782
Chemical, Wet	816	980
Ground Wood, dry	644	.....
Ground wood, moist	44,945	32,575

Out of the total quantity of ground wood Canada supplied 7,876 tons, compared with 3,625 tons in August 1913, or 49,269 tons from January to August, as against 32,741 tons during the same period of 1913. Since then, up to September 5, the last Custom House return before me, the British market has received 370 tons of bleached chemical dry; 12,620 tons of unbleached chemical, dry; 1,184 tons of chemical, wet, and 29,441 tons of ground wood moist. Of the latter, Canada supplied 9,628 tons, and Newfoundland 2,912 tons. With these shipments all traces of a paper famine should be deleted from one's mind. Shipping is now constant between Scandinavia and Canada, and judging by it, I often ask myself the question: "Are we really at war?" Scandinavian paper is in the market as well as plenty of Scandinavian pulp. But putting all things aside there is an unsettled feeling prevailing, and this must be expected. Prices are now in or about the following: Groundwood, moist £2 5s to £2 15s; sulphite bleached (No. 1) £13 to £15; easy bleaching (No. 1) £11 to £12; "news" or strong quality sulphite, £10 to £11; soda unbleached (No. 1) about £9 to £10, soda kraft £10.

Shipments from Norway are more regular than those from Sweden, owing to the mined state of the North Sea. So long as the Scandinavian mills can get coals, sulphur, and chemicals, the supply of pulps to England may be considered as regular, but to predict anything as to the quantities and prices is beyond one's comprehension at present. It must be remembered that Germany, Austria and Finland are out of the pulp world at present, and for some time to come. It is stated freely in Copenhagen that Norway will be selling ships to Americans very shortly on a large scale, as the States are anxious to build up a commercial fleet and to pay four hundred million dollars for it. "It is a splendid opportunity for Norway," said a Christiania man to me the other day, "and no doubt the pulp and paper trades will benefit."

Esparto Chemicals and Fillings.

Manufacturers of esparto papers have received a severe check owing to the shortage of the raw material. Few sellers will now venture to make new arrangements for the sale of esparto and there is a strong enquiry from nearly all the consumers. Prices have gone up enormously and the shipments to Scotland and England in August were something like 4,000 tons less when compared with August 1913, which not then even a good month for arrivals. There is also a keen demand for rags and waste papers, and prices are soaring high. Supplies, however, are very fair. America is largely in the market for waste papers and shipments from England lately have been heavy. Chemicals are slightly dearer, but as things are being gradually evolved on a quieter basis prices are going down somewhat. Stocks are good and the demand on home account is satisfactory. China clay contracts for 1915 are being made on easier terms, when compared with 1914, but other fillings, like mineral white, are slightly dearer owing to extra expenses which the war has thrown on the producers.

The Dilation of Printing Paper Owing to Moist Air

Complaints about defective register when printing several colors are constantly met with in technical journals. As is well known, paper expands when it becomes moist and contracts on drying, so that printing papers must be prevented from drying or absorbing moisture between printing the various colors. The humidity of the air and consequently the percentage of moisture in the paper depends, however, on the temperature of the storing and working rooms. Frequently the work room is a cellar and too moist. In addition, insufficient ventilation is lacking for supplying the requisite drying air. In such rooms the papers which was subsequently to be employed for polychrome printing should always be placed for some time before being used into waste paper of a uniform temperature and be stored in the printing room. The immediate proximity of hot stoves, steam pipes, and draughty places must be avoided. When the printing paper is stored in large piles and in moist places the moisture is absorbed only at the edges and causes corrugations here, so that folds are made in the paper on beginning to print. In the case of single color work these small folds are of little importance, but when printing with several colors they are very troublesome because the individual prints can never register exactly. In papers for polychrome printing the various dilation of the paper in the direction of the machine and in the transverse direction must be regarded during the manufacture of the paper and negated as much as possible. These papers are, therefore, sent not only through the roll supercalender in the direction of the machine, but also, after being cut to the correct size, in the transverse direction through the sheet supercalender. The dilation of the paper is thereby negated as much as possible and the difference of dilation in the direction of the machine and the transverse direction is diminished. The printer should be informed which is the machine direction of the sheet. This is determined most simply by cutting out of the paper a circular disc about 10 cms. in diameter and placing it flat on the surface of water in a saucer. The top side of disc must not be moistened. After removing the paper

from the water it begins to roll up, two opposite points of the periphery of the disc rising towards one another. The diameter of the disc remaining rectilinear is the machine direction.

In lithography, in addition to the difficulties of the registration of the sheets there is also that of color printing, i.e., the connection of paper and ink. In this case, the grounding with varnish which is so necessary is frequently neglected for reasons of economy. When cheap kinds of paper are used in addition, trouble in the form of loss of time stoppage of the machines and waste is soon met with. The temperature of printing works for polychrome printing should be, as a rule, 15 deg. C. In rooms lit from above the maintenance of this temperature is particularly difficult, because in summer the sun is very powerful and in winter moisture readily enters. In such cases, the top sheets of the pile must be covered carefully in order to prevent them rolling up and forming folds. In addition, proper equalization of temperature should be provided for by providing ventilators. The so-called skinning met with when piling the printed sheets on one another can be prevented by the mixing of the inks with liquid sicative being avoided as much as possible, for this drying agent negatives the absorption of even the best printing paper when first printed, so that the second print is not held sufficiently by the paper. A skinning layer, which dries very slowly and, of course, prevents any other color being absorbed, is formed on the places already provided with ink. The inks lie without any hold on the layer and the finely pointed shades are squeezed apart. In this case, frequently, only treatment of the separate sheets with talc is a remedy.—Der Papierfabrikant.

Economical Operation of Paper Machines

Carelessness and neglect in the treatment of the paper machine and its spare parts may, as is well known, lead to great expenses. It is, for instance, not advisable to have only one long piece of hose lying at the side of the paper machine, as its length makes it difficult to use, and it is subject to a great amount of wear by being constantly pulled backwards and forwards along the floor of the machine. There are, of course, such hose which are provided with a metal spiral or hemp twine spirals to protect them against the rapid wear. This however, deprives the hose of its flexibility. It is much more practical to employ a number of shorter pieces of hose at various parts of the machine instead of one long length of hose. This further enables water to be given at several places at the same time, so that the cleansing of the wet end takes place with much more rapidity and the pauses become shorter. A piece of hose should also be fixed in the neighborhood of the pulp chest so that the latter may be cleansed when necessary. If special circumstances demand the use of a long piece of hose the latter should not be allowed to lie upon the floor, but should be hung by means of hooks at the side of the wet end. This not only saves the hose but removes the danger of the attendants stumbling over the same. Rubber hose should not be allowed to lie for any great length of time in one position on iron or other metal parts, as some kinds of rubber become hard and brittle at such places. It is advisable to

wrap such iron or metal parts with a piece of old rubber, felt or the like, in order to prevent any direct contact. Hemp hose, notwithstanding impregnation, is not serviceable on account of the wet conditions. The hose should have such a length as to allow of its being shortened once or twice at the end where it is fixed to the mains (at which place it is well-known the hose suffers most severely) without being too short.

Deckle straps are still more expensive than hose, and should be carefully protected against grease and oil. Any spots which may occur should be immediately removed with warm soda lye or benzine. Care should also be taken that the wire and the deckle strap have exactly the same speed, as otherwise the latter would wear and become rough by the friction, as a result of which the edges would lose their sharpness. The guide rolls of the deckle straps should be provided with cups to prevent all dropping of lubricating oil. The guide rolls should rotate with the least possible friction. Further, heavy deckle straps, for instance in the case of Fourdrinier cardboard machines, are best driven from the couch roll.

Wherever possible two strainers should be provided, so that in the case of one being stopped up it could be simply cut out and cleaned without having to stop the machine. In cases where papers which require exceptionally fine sorting, both strainers can be employed at the same time, the one strainer being placed somewhat higher than the other so that the pulp after passing the first strainer, immediately enters the second, which is provided with much finer slots. The slots of the strainer should never be cleansed or scraped with pieces of sheet steel, hoop iron, and the like, as the slots are widened by this process. Soft bronze wire or stiff sea grass brushes are most suitable for this purpose. On the inside the slots should be cleaned by means of a flat piece of medium hard wood cut to a sharp edge on one side; with this the slots are rubbed backwards and forwards, whereby the thin piece of wood pushes the knots over to the other side where they can be easily brushed off. Flat strainers should be so erected that they can be easily raised into a perpendicular position. It is, for instance, possible to erect a winch on the outside of the pulp chest, and connect the same up to the frame of the strainer which is to be cleaned by means of a wire rope. This device works much quicker and is much safer than lifting the heavy frame up by hand.

Froth blisters are a frequent cause of breaks in the paper. The formation of froth often takes place as a result of the back water from the wire, containing a concentration of froth-forming stuffs, being repeatedly employed, and sometimes as a result of the stuff having too great a drop from the pulp chest to the wire. To remove the froth before the gate a shower pipe should be fitted, pointing almost vertically upwards so that the falling drops destroy the foam.

For removing wrinkles the tender should have an ample supply of strips of paper or mull-muslin of various widths always at hand. Strips of felt or old pieces of belting should also always be kept in readiness in order to be able to regulate the tension between the various parts of the machine at any moment. For fixing these strips on to the belt pulley a mixture of 50 parts of molten resin and 50 parts of drip oil, which should also always be kept in readiness, in use, has been found to give excellent results. The latter points will probably appear superfluous to some paper-makers, but the observation of the same will tend to save much waste paper.—Der Papierfabrikant.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

A government return has been issued showing the trade between Canada and the United Kingdom in 1913. It shows that a considerable increase has been made in the sale of pulp, strawboard, millboard and wood-pulp board, to English and Scottish buyers; but there is a regrettable falling off in the sale of printing and writing papers, which Canada exported to the extent of 58,452 cwt. (valued at £31,572) in 1913, compared with 77,015 cwt. in 1912, 99,652 cwt. in 1911, 186,900 cwt. in 1910, and 326,146 cwt. (valued at £161,793) in 1909. These figures show that the Germans have captured a large portion of the Canadian trade in Great Britain, along with the Scandinavians, and there is a great chance now for manufacturers in the Dominion to regain what they have lost. The outlook as regards millboard, wood-pulp board, and strawboard, is very cheery for Canada, but to retain trade and develop it manufacturers must keep a very close eye on the market of the United Kingdom. In 1913 Canada exported to the English and Scotch market 230,546 cwt. (valued at £106,043) of mill, wood pulp and other boards, as against 217,771 cwt. in 1912, 193,865 cwt. in 1911, 199,276 cwt. in 1910, and 132,687 cwt. (valued at £59,433) in 1909. These figures show an excellent increase in trade, which is well worth conserving. In pulp the supplies from Canada reached 69,357 tons, compared with 42,398 tons in 1912 and 33,563 tons in 1911. The exports of the British mills to Canada in 1913 were: Paper of all sorts, 172,158 cwt., compared with 178,067 cwt. in 1912, and 152,854 cwt. in 1911; papermaking materials, such as rags and wastepapers, 9,596 tons, compared with 9,656 tons in 1912 and 9,531 tons in 1911 and 10,025 tons in 1910.

* * *

Thanks to the foresight of Lord Northcliffe and those associated with him in London, Newfoundland is gradually occupying a conspicuous place in the paper and pulp imports of the United Kingdom, and in this connection credit must also be given to Mr. A. E. Reed, one of the most hardworking and most straightforward men in the British industry. Comparing last August with August 1913 paper received from Newfoundland has increased by 28½ per cent in the imports and by no less than 154½ per cent when compared with August, 1912. The actual imports from Newfoundland into the British market are: Reel paper, 860,123 cwt. (valued at £428,066), in 1913, compared with 790,653 cwt. in 1912, 523,116 cwt. in 1911, and 340,365 cwt. in 1910; pulp 50,659 tons (valued at £123,098) in 1913 compared with 41,768 tons in 1912, 30,454 tons in 1911 and 12,291 tons (valued at £31,463) in 1910. Of course, it may safely be said that Newfoundland is a keen competitor in the British market with Canada as regards reel paper, or newsprint, and she has also captured a small proportion of the Canadian pulp trade. In return for these imports British mills export to Newfoundland paper of all kinds, which, according to the latest return issued by the government, reached 3,773 cwt. in 1913, 4,677 cwt. in 1912, 4,056 cwt. in 1911, 4,056 cwt. in 1910, and 4,466 cwt. in 1909.

The British paper mills are showing great patriotism in connection with the war. There is hardly a mill but has been hit in some way or another, and if the owner is not on military service he has his sons or some of his employees in the army. In nearly every case the dependents of the men at the front are being provided for by the men at the mill or the mill owner. Here is an example of one of the typical letters that has been addressed to employees, in this case from John Dickinson and Co., who own three large paper mills and employ hundreds of hands—"While we feel that it is our duty to endeavor to keep our works going, subject to this we desire to urge the men in our employment to enlist in His Majesty's Forces. But as it is not in the best interests of our country that any should leave whose absence will stop the work of others, all who desire to enlist should first consult the foreman of their department. Places will be kept open for all who leave with the consent of the company. Half wages will be given to all who are married or who have dependents, and one quarter wages to all unmarried men, and a bonus of one month's wages or salary will be given to all those who return to the company at the end of the war." Messrs. Bentley and Jackson, the well-known papermakers' engineers, of Bury, have lost 14 of their men who have joined the troops. But work is going on all the same, and to the wife of each man Messrs. Bentley and Jackson are paying \$2.40 a week, with an additional 24 cents for each child who is not of working age.

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Producers of china clay in Canada, owing to the war, have now a great opportunity of showing up their products and expanding trade. From Fowey, in Cornwall (England) shipments cannot be made regularly until the European crisis is over, and meantime Americans are getting very nervous about future supplies. During August 30 198 tons of china clay was exported, compared with 39,176 tons in August, 1913. Of course, the reduction in these figures is not much to complain of, but then it must be remembered that the position of Fowey is not a good one for making shipments from in time of war. Then, again, labor has been reduced owing to the men being called away to the army, so that practically the output of china clay has been reduced to the extent of 10 or 12 per cent, without any change in prices.

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The Germans have always taken the lead in the production of dyestuffs and coloring stuffs for the paper trade, and in this respect they have been difficult to beat. In England, however, the production of dyes, colors, and so on, is in the hands of very capable firms, like Read Holliday and Sons, Ltd., of Huddersfield, who are leaving no stone unturned now that the British Navy has locked up the German coast and killed all Teutonic shipping. The president of the Trade Board has also taken up the matter and he is considering the best means of obtaining for the use of British industry sufficient supplies of chemical products, dyestuffs, etc., largely imported from the countries we are at war with. Canadians, however, if in doubt could not do better than write Read Holliday and Sons, Ltd., if stocks are down.

Mr. Hans Lagerlof, the president of the Scandinavian-American Trading Company, New York, was in London the other day on a short visit. Mr. Lagerlof was in Hamburg when war was declared and he remarked that beyond mobilization work, business was going on as if nothing had happened. He made his way to Sweden, and as time passed, the Swedish mills were suffering from the want of coal and sulphur. The call up of the Swedish army has also seriously affected labor in the pulp and paper mills, many of which are now closed.

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Mr. F. E. R. Becker (Messrs. Becker and Co., Ltd., pulp importers, London) has been selected to serve upon the Arbitration Board, appointed by the British Admiralty, to deal with matters arising out of the requisition of ships for service in the Royal Navy during war time.

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At a board meeting the other day of Edward Lloyd, Limited, the half-yearly dividend due on October 1 was declared on the five and a half per cent cumulative preference shares. In view, however, of the financial situation arising out of the war and the necessity of conserving the company's resources, the company regrets that it is not possible to declare an interim dividend on ordinary shares.

* * *

Messrs. J. Marx and Company, Paper-Mayers' Engineers, London, are unable on account of the war, to keep up the relation which has existed with Messrs. Thiry in Belgium and pending hostilities with Germany will manufacture their special and patented paper making apparatus in England to the fullest extent. They report that their preparations for this are well advanced and facilitated by the fact that a good many specialties were built in England a long time before the war.

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One of those prominent in the paper industry who has been commissioned for service in the British army is Mr. R. Marx, Jr., who has for the time being exchanged his profession as an engineer for a commission as Lieutenant in the Royal Field Artillery of the Regular Army, for which his previous connection with the Officers' Training Corps of London University should be a valuable preparation.

CANADIAN PULP IN JAPAN.

The Department of Trade and Commerce says that Canadian pulp manufacturers have now an opportunity to do a profitable business with Japan. In Weekly Report No. 537 it will be seen that Germany and Sweden have nearly the whole of the export trade in pulp to Japan amounting to \$1,850,000 out of a total trade of \$2,100,000. As a result of the war, exports from Germany have entirely ceased, and those from Sweden are bound to suffer. In consequence the price in Japan has gone up by 20 per cent for pulp of a medium quality and will probably go higher. No doubt a large part of this increase will be eaten up increased freight charges and war risks, but it is a good opportunity for Canadian pulp manufacturers to get a foothold in this market. Pulp of a medium quality was quoted before the war at 8 sen (4 cents) per pound. The duty is \$1.67 a ton. The largest dealers of importance are the Mitsui Bussan Kaisha, 1, Suruga-cho, Nihonbashi-ku, Tokyo.

The manager of one of the largest American importing houses in Japan stated that there is such a shortage of sulphite pulp in this country owing to ship-

ments from Scandinavia via Hamburg having entirely ceased, owing to the war, that price is hardly a factor, and the only question is one of supply. This firm sold last week a large quantity of very poor American pulp ("almost black," he said) at 50 per cent above normal prices, and can dispose of any quantity of Canadian pulp offering, at high prices, throughout the war. Nearly the whole of the imports of pulp into Japan have been Scandinavian in origin, shipped in German bottoms via Hamburg, so that the normal source of supply is entirely cut off.

OPPOSE FELT MAKERS' SPECIFICATIONS.

(Special to Pulp and Paper Magazine.)

New York, September 28, 1914.—The National Association of Waste Material Dealers at its regular quarterly meeting appointed a committee with authority to meet with a committee from the Felt Manufacturers' Association to take up the discussion of the so-called 2-cent clause in the felt makers' specifications for stock. The clause objected to is as follows:—

"Should any stock, upon receipt, appear to be packed dry and free from rubbish and out-throws, and later upon opening, prove to contain objectionable material and moisture, shipment will be sorted, the out-throws weighed and the shipper will be charged with proper deductions for moisture or out-throws, or both, freight on out-throws or moisture or both, with the cost of assorting and weighing at the rate of 2 cents per pound on actual weight of out-throws assorted and the shipper accepts such conditions as a correct charge of approximate cost of such sorting and weighing.

"Any bale found to contain inferior grade of stock upon opening, if accepted, it will be taken at the price of the lowest grade of stock found therein.

"We reserve the right to reject the whole of a shipment, if any part of same contains moisture, rubbish or any material not suitable for making paper or felt.

"All waste material and out-throws to be disposed of by us and not to be returned to the shipper."

The committee consists of Milton Birkenstein, Louis Birkenstein, and Milton Louventhal, all of Chicago, Ill.

TRADE INQUIRIES.

Recent inquiries to the Department of Trade and Commerce regarding Canadian products are:—

906. **Wood-pulp.**—In view of the possible shortage of paper in Scotland, inquiry is being made for large supplies of Canadian wood-pulp, and requests are received for names of manufacturers able to make immediate shipments.

911. **Felt paper fibre.**—A London manufacturing company is open to contract for supplies of felt paper fibre, and invites samples and quotations from Canadian manufacturers able to fill orders promptly. Samples can be inspected at the Department of Trade and Commerce, Ottawa.

959. **Wood pulp.**—A Liverpool firm desires the addresses of Canadian manufacturers of wood pulp, both mechanical and sulphite.

983. **Wood pulp.**—A correspondent at Genoa, stated to be in immediate touch with paper manufacturers in Italy, reports a market there for Canadian wood-pulp in view of the suspension of German supplies and would like to hear from exporters in the Dominion.

Any manufacturer in the Dominion who wishes to avail himself such opportunities may secure particulars on application to the Department.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

It is interesting to know that the war in Europe has been beneficial to some of the American paper manufacturing companies. According to reports from Holyoke, Mass., the American Writing Paper Co. is running all its mills practically at full time. Whether this is due in some measure to anticipatory buying by customers who expect an advance in prices is not clear at this time. The company gets its sulphite from Norway for the most part and it is expected that regular shipments will not be interrupted. Its rag supplies largely come from Germany, and substitute sources of supply will have to be found.

* * *

The property of the Ballston Paper Company at Ballston Spa, N.Y., was sold last week on a mortgage foreclosure by Referee Burton D. Esmond. It was purchased by William A. Mehan for \$6,000. The mortgage was held by the American Axe and Tool company which occupied it as an axe shop before it was sold to the paper company.

* * *

H. J. Caldwell, of Carthage, N.Y., treasurer and general manager of the Champion Paper Company, in which he is a principal stockholder, is being mentioned among the republican leaders of Jefferson county as a likely candidate for member of assembly to succeed John G. Jones.

* * *

The new owners of the Anchor Paper Mills have incorporated under the laws of the State of Connecticut and adopted the corporate name of Anchor Paper Mills Company, Inc. The capital stock is \$100,000, of which \$65,000 is already subscribed for. A cash capital of \$18,000 has been paid in. The officers of the new concern are: President and treasurer, J. P. O'Brien; vice-president, E. W. Broder; secretary, E. H. Richardson.

* * *

Paper manufacturers of this country are being urged to take advantage of the present crisis in Europe to establish their wares in virtually every corner of the globe where English and German firms heretofore have held the entire trade.

An exhaustive report of paper trade conditions, together with samples of paper in use in the various countries, has been issued by the bureau of domestic and foreign commerce at Washington, and is on view in the Commercial Museum, Thirty-fourth and Spruce streets, for the benefit of manufacturers.

The samples and reports cover every country in Central and South America, Africa, India, Australia and Europe, as well as the principal large islands in every ocean. These samples and reports have been gathered by the American consuls in the various countries.

American paper is said to be well thought of in most of the South American countries, but the failure of our manufacturers to push their goods has resulted in very little of it being used. Argentina is the only country that has made any progress in papermaking

and its output is only slightly in excess of \$3,000,000 yearly.

* * *

An application is in the course of preparation to be presented to Judge Ray of the United States Court at Watertown, N. Y., for a further extension of time under which Mark S. Wilder as receiver, shall operate the Remington-Martin Company, the Raymondale Paper Company and the Norwood Paper Company, the three northern New York paper and pulp mills which were petitioned in bankruptcy last May by a creditors' reorganization committee after several creditors had secured judgments and were about to levy on the assets of the three companies.

The additional thirty days to be requested will enable the creditors' reorganization committee to perfect and put into operation its plan for the readjustment of the three companies, after which it is expected the bankruptcy proceedings will be dismissed.

This makes the third extension of time granted the receiver in the operation of the mills, the other periods being for sixty days. Receiver Wilder told Judge Ray when the second extension of time was granted that the three companies were being operated at a profit, the combined pay roll approximating \$30,000 a week.

* * *

The Hartford (Conn.) Times says editorially:

"Simultaneously with the report that extra demands will be made on our paper and pulp mills because of war's embarrassments, comes the assurance that both Maine and Vermont are ready with record cuts of timber and that Vermont's big crop is already on its way down the Connecticut river to the great mills at Holyoke and other points along its banks. Two years ago conditions were unfavorable both for cutting and for getting the lumber down the rivers. This year the mills are to have all of the supply of last winter and considerable that should have come two years ago.

* * *

George C. Sherman, the secretary and treasurer of the St. Regis Paper Company of Watertown, N. Y., and one of the principal stockholders of the Taggart's Paper Company, has just purchased the interest of David W. Anderson in the latter concern.

* * *

A fire that caused a damage estimated at \$30,000, destroyed the wood room of the Bear River Paper Company at Petoskey, Mich., and would have consumed the entire plant but for the work of the city department, aided by a favorable change in the wind. The loss is covered by insurance. Two bog cars belonging to the Grand Rapids and Indiana railroad were burned, entailing an additional loss of about \$2,000. The blaze originated in the wood room in a manner not ascertained. Firemen were kept on duty all night to prevent the blaze from spreading to other parts of the mill. A hundred men were thrown out of employment, as the plant will be shut down several weeks.

NEW PATENTS

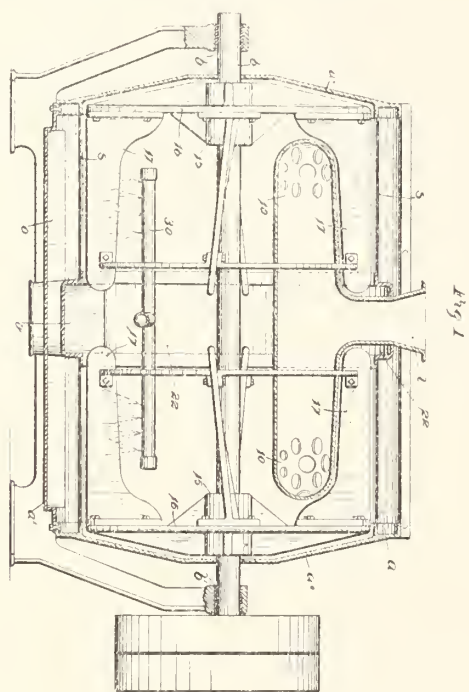
CENTRIFUGAL PULP-SCREEN.

Anton J. Haug, Nashua, New Hampshire, Patentee.
Patented Aug. 11, 1914, in United States Patent Office.
1,106,808.

The patentee says:—The object of this invention is to produce a centrifugal screen having features of novelty and advantage, of simple construction and having a high efficiency at a low operating cost.

I have illustrated my invention as embodied in a machine for screening pulp and will describe this embodiment of the invention.

Figure 1 is a side view in central vertical section of a machine embodying my invention.



Referring to the drawing, "a" denotes the machine casing, which comprises a horizontally arranged cylindrical shell a' and end plates a^2 . b is a shaft supported in bearings b' at each end of the casing and extending through said casing. s denotes the screen drum, which is cylindrical in form and is supported at each end from the inner walls of the end plates. The screen illustrated in the drawing and described herein is of the stationary type, though it is not essential to the operation of the device that it should be.

Arranged centrally of the length of the casing is an inlet which passes through the shell and screen drum and then branches toward each end of the machine in feed spouts 10—10, which are of course located within the screen drum and spaced therefrom. These spouts have holes near their outer ends through which the stock is delivered to the interior of the screen drum.

Mounted on the shaft within and near each end of the casing are hubs 15—15, carrying disks 16—16,

from the outer edges of which project blades 17—17, which extend between the screen drum to the feed spouts 10—10. The shaft is intended to rotate at a high rate of speed, and these blades catch the pulp as it is delivered through the openings at the ends of the feed spouts, and throw it against the screen drum with such force as to cause the fine pulp to pass through the screen against the inner wall of the casing, whence it drops to the bottom of the machine and passes out through the pulp outlet o . The blades are oppositely inclined toward the center of the machine, as illustrated, in order to give the pulp a tendency to move toward the center of the machine, with the result that the slivers and coarser particles which cannot pass through the screen travel from each end of the machine toward the center where they are delivered to the sliver outlet o' . To make sure of clearing the interior of the machine from slivers which collect at the center, I prefer either to project a circumferential ring 20 just inside of the screening drum as illustrated in Fig 3 which will cause the slivers when they strike this ring on either side to drop and pass out of the sliver outlet, or I can cut away the center of the screen, and interpose a trough 22 which will receive the slivers and carry them down to the sliver outlet at the lower part of the machine, as illustrated at o' in Fig. 1.

It will be seen that as the stock is fed only through the outer ends of the feed spouts it will be thrown against the outer ends of the screen drum, and then moved toward the center of the machine. The screening operation is a continuous one, and there will always be a steady current of slivers toward the center of the machine.

The screening operation is practically an instantaneous one, that is to say the screening is all done at the moment when the pulp is thrown against the screen by the blades. Such pulp as is not screened at this operation is carried along with the slivers and lost in the waste. In order to bring the machine up to the highest point of efficiency, and to prevent such waste of stock, I introduce a shower pipe 30 inside of the blades, preferably near the lower part of the machine, this pipe being pierced at intervals along the side to project the water toward the screen.

The water is picked up by the blades and thrown against the inner surface of the screen in the form of a spray, which beats upon the stock which is moving toward the center of the machine, washing through the screen any good stock which is being carried along with the slivers. With the use of a comparatively small amount of water the efficiency of the screening operation can be very materially increased without materially increasing the amount of water in the stock.

The machine made in accordance with my invention is simple in its construction, has a large capacity, is extremely efficient in its screening operation and easily handled and controlled. The inclination of the blades may be varied for stock of different densities, that is to say if a heavy stock with a small amount of water in it is to be screened, the inclination of the blades can be reduced, giving such stock as is not screened at the first impact a longer time to travel

across the face of the screen. during which it is subjected to the action of the spray from the shower pipe, while a thinner stock which will screen more creased. Also, if desired, the feed spouts can be shortened up to deliver the stock near the center of the machine, and the blades can be inclined in directions opposite to those illustrated in the drawings, forcing the slivers toward the ends of the machine, where they can be collected and removed through two separate outlets. This is merely a variation of which a machine made in accordance with my invention is susceptible.

RECLAIMING WASTE PRODUCTS IN THE MANUFACTURE OF SULPHITE FIBRE.

HUGH K. MOORE and ROBERT B. WOLF, Berlin, N. H., Patentees—Patented in U.S. Patent Office Sept. 15, 1914.

In describing their invention, the inventors say:—

This invention has relation to the reclamation of waste products in the manufacture of sulphite fibre and more particularly to the recovery of the sulphur dioxide, which, heretofore in actual practice, has escaped

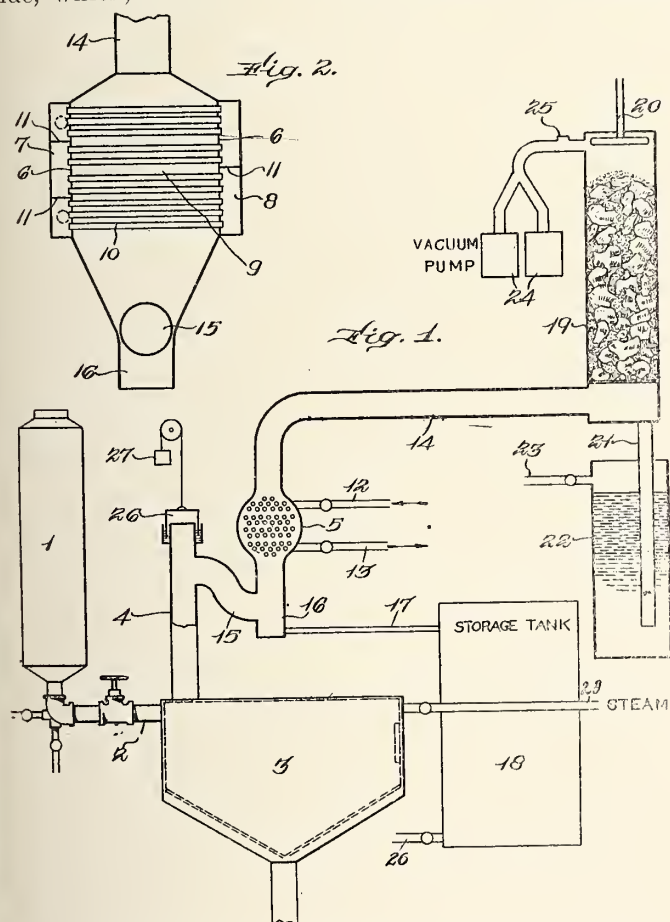
In order to prevent the loss of sulphur dioxide, it is desirable that the products of condensation should be kept as near the boiling point as possible to prevent the absorption thereby of the sulphur dioxide. Further, to secure a greater strength of acid solution in the absorber, it is necessary to eliminate the presence of air in the apparatus during the "blow." We accomplish these results by means which will be subsequently described herein.

On the drawing, in Figure 1 an apparatus is conventionally shown for carrying out our invention. Fig. 2 shows a section through the condenser.

The digester is illustrated at 1 and is of the type used in the manufacture of sulphite fibre. In it are placed the chips and the acid (calcium bisulphite and more or less free sulphurous acid), and, after the neck is sealed, steam is injected into the digester to bring the contents thereof to the proper temperature. If desired, sulphur dioxide may be injected into the digester in accordance with our application Serial No. 541,246, filed February 1, 1910. After the wood has been cooked at the proper temperature for the proper length of time and the cellulose fibres have been freed from their cementing materials, the contents of the digester are blown in the usual way through the pipe 2 into a blow pit conventionally illustrated at 3, which is constructed with the usual false bottom for permitting the escape of the waste liquors. As usual, the interior of the blow pits it at slightly less atmospheric pressure. Hence, when the contents of the digester of ordinary size are discharged into the blow pit at a steam pressure of say 45 to 75 pounds per square inch (not including the pressure due to the static head), from 18,000 to 20,000 pounds of steam are liberated in the blow pit from the discharged water. The temperature of the contents of the digester varies from 250 deg. F. to 320 deg. F., and, as soon as the materials reach the blow pit, vapors arise therefrom and are conducted away through a vomit stack.

4. Heretofore, in actual practice, these stacks have always opened into the atmosphere into which the rising vapors escape and become dissipated. In addition to the vapors, there has been an escape of a certain amount of free sulphur dioxide, which was not utilized in the cooking operation. The escape of this free sulphur dioxide is a serious menace to vegetation and is highly objectionable on account of the odor.

In accordance with our process, the vomit stack is closed to the atmosphere during the blow, and the vapors and gases are conducted to a surface condenser, conventionally illustrated in Fig. 1 at 5. This surface condenser may be of any suitable or desired type. Preferably, as shown in Fig. 2, it is of the horizontal type and is provided with diaphragms, 6, 6 forming compartments 7, 8 and 9, the compartments 7 and 8 communicating through tubes 10 passed through the chamber 9. Partitions 11 divide the chambers 7 and 8 as shown, so that the cooling medium takes a sinuous path through the condenser. As shown in Fig. 1, the vomit stack discharges into the lower extension of compartment 9 through conduit 15, and the gases and vapors are caused to circulate upwardly and around the tubes. Cold water or any other suitable cooling medium is injected through the pipe 12 to the chamber 7, and passing through the tubes is discharged through the circulating pipe 13. The vapors entering the condenser from the vomit stack are condensed and pass from the trap 16 through a pipe 17 to a receptacle 18 from which they may be drawn by the valved discharge pipe 26. Ordinarily we employ water as the cooling medium at its seasonable tempera-



from the blow pit after the cooked charge has been delivered thereto from the digester.

In our previous application Serial No. 590,158 filed November 1, 1910, we have illustrated conventionally an apparatus for and described a process of recovering sulphur dioxide by bringing the vapors from the blow pit into contact with the chilled surfaces of a surface condenser, and condensing them, and then separating the sulphur dioxide from the other gases by absorption in a suitable absorber.

ture, although in lieu thereof some other chilled cooling medium may be utilized, or the water itself may be cooled prior to its admission to the condenser.

The effect of condensation of the vapors is to reduce to liquid form the water vapor and such compounds as wood alcohol, benzaldehyde, acetone, acetic acid, and other vapors which would condense at or slightly above the temperature of the cooling medium, the quantities, amounts and character of these compounds depending more or less upon the methods, temperature, etc., used in cooking as well as the nature of the materials cooked. The application of the principle of recovering these compounds by condensing vapors arising from the blow pit, while herein described as applying to the sulphite process, may be applied to any other process in which free gases are discharged.

The condensation of the water vapor to water permits the absorption by the condensed water of only a relatively small proportion of the free sulphur dioxide gas which escapes with the vapor, and consequently the great portion of free sulphur dioxide which is uncondensed passes through the condenser and is conducted away therefrom by means of the pipe 14 to an absorbing apparatus, which is illustrated as comprising a tower 19 containing limestone. In the upper end of the tower is shown a sprinkler head 20 through which water is sprinkled into the tower. In the passage of the sulphur dioxide through the tower, it reacts with the lime and is finally discharged through the pipe 21 as a solution of calcium bisulphite and free sulphurous acid. The effluent from the tower is collected in a tank 22 from which it may be drawn by a valved pipe 23. A vacuum pump 24 is connected to the upper end of the tower. In the conduit leading to the vacuum pump, I have indicated a regulator check valve 25 of any suitable construction, which will open when the vacuum is too great to avoid damage to the blow pit.

The product of condensation, which is collected in the tank 14 or the tank 18 as the case may be, may be neutralized with lime. This has the effect of precipitating the sulphur dioxide in the form of calcium monosulphide (CaSO_3) which is removed by passing the materials through a filter press, leaving the filtrate practically clear and neutral. The filtrate contains acetic acid in the form of a lime or other salt, methyl alcohol, benzaldehyde, acetone and other organic acid salts and compounds which maybe separated and removed by any well known process, such as evaporation, fractional distillation and precipitation by various reagents. The contents of the tank 22 may be used in the digesters in cooking the wood.

The vomit stack 4 at a suitable point has a luted cover 26 partially balanced by a weight 27 so that the stack may be opened to the atmosphere. Immediately prior to the blow, steam is injected into the pit 3 through a valved steam pipe 28 for the purpose of completely filling the pit and the stack with steam and thereby forcing therefrom any air which is contained therein. Then the cover or cap 26 is closed, the supply of steam through the pipe 28 is cut off, the vacuum pump 24 is started, and then the contents of the digester are discharged into the blow pit. The steam in the blow pit, prior to the admission of the contents of the digester, rapidly condenses and there is substantially no pressure above atmospheric pressure in the blow pit. The rising vapors pass from the vomit stack through the conduit 15 into the condenser 5 and are condensed as explained.

We have stated that a small proportion of sulphur dioxide is absorbed by the water of condensation in

the condenser. Preferably, therefore, the water of condensation is maintained at a temperature but slightly less than the boiling point so as to limit the absorption thereby of the free sulphur dioxide. But utilizing the horizontal surface condensing the vapors from the blow pit, the only water which can absorb the sulphur dioxide is that which has been condensed from the steam coming from the blow pit, and the water being brought out near the boiling point, it contains a minimum amount of gas. Consequently the greater volume of free gas will not be absorbed by the water but will pass on to the absorbing tank or tower. Furthermore, by the employment of a surface condenser, the water, which is used as the cooling medium and which is delivered from the condenser, is in a clean heated condition and may be utilized for a variety of purposes for which it could not be used if it had been previously employed in the direct condensation of the vapors by contact therewith, because in the latter case, it would have absorbed a portion of the sulphur dioxide and other products from the blow pit.

In the form of condenser shown, the products of condensation dropping from the tubes are met by the incoming vapors and are heated thereby nearly to the boiling point so as to effect the liberation of sulphur dioxide absorbed thereby.

We have herein stated that we may treat the product of condensation in the tank 18 with lime to reclaim the sulphur dioxide absorbed therein. On the other hand, however, we may first subject the product of condensation to a vacuum for the purpose of liberating the sulphur dioxide which may be condensed or absorbed in any suitable manner. The remaining product of condensation, which contains acetic acid, may be recovered as previously indicated.

We have herein stated that, prior to the blow, the pit and vomit stack are swept clean of air by the injection of steam. This is a feature of great advantage as it relieves the vacuum pumps of the necessity of exhausting the air from the pit and stack, and makes it possible to use a smaller vacuum pump than would otherwise be necessary on account of the presence of inert gases. Further, by eliminating the inert gases, a smaller absorption apparatus may be used. Because of the absence of air, a commercial or usable acid may be made in the absorption apparatus, since the effects of partial pressures are obviated. Furthermore, owing to the absence of air, an acid solution is obtained in which the portion of free sulphurous acid is greatly increased, and, in addition, there is no oxidation of the sulphur dioxide to trioxide.

PULP ENOUGH TO SUPPLY THE WORLD—Now is the time to secure your supply of pulp for the next ten years and avoid the possibilities of higher prices. Inquiries invited. Address, F. E. R., 404 King's Hall Building, Montreal, Que.

OWN YOUR OWN PULP AND TIMBER LIMITS,—Buy now on easy terms before the prices double. Full particulars on application to, Pulp and Timber, care Pulp and Paper Magazine, Montreal, Que.

WANTED.

Three to five thousand acres of wild land suitable for game preserve. Tract should contain one or more lakes and streams, good hunting and fishing. Must be fairly accessible. Address, giving full particulars, J. G. Dorance, 532 N. Howard St., Baltimore, Maryland.

PULP AND PAPER NEWS

Fred. L. Radcliff of the Ratcliff Paper Company Toronto, who is a member of the Militia Committee of the National Council of the Y. M. C. A. has returned after spending a few days in the camp at Valcartier. He reports that the volunteers greatly appreciate the facilities which have been placed at their disposal by the Y. M. C. A. in furnishing stationery. A large quantity of which is now on hand. The paper firms and jobbers have been very generous in their donations. Thirty thousand sheets of note paper and twenty five thousand envelopes are used each day.

The paper box industry is one that is benefitting by the war and firms, which are now producing made-in-Canada articles that were manufactured in Germany before the outbreak of hostilities, are giving orders for many kinds of receptacles. The Rudd Paper Box Company, Toronto have recently increased their staff by about twenty per cent and in some departments are working overtime on certain nights of the week. Other firms also report a good outlook.

Thomas Gain, sales manager of the Don Valley Paper Mills, Toronto, has returned from an extended trip to Montreal, Ottawa and Montreal and reports that business is very good. Mr. Gain has fully recovered from his recent illness and is now at his new office on the seventh floor of the new Dominion Bank building every day.

B. Biermans, president of the Belgo-Canadian Pulp and Paper Company, Shawinigan Falls, Que., has returned from spending several months in Europe. He was in Brussels when the Germans entered the Capital and on Sept. 10th he and his wife while motoring to the Coast to catch a vessel for Canada passed through the devastated city of Louvain, where the Germans wrought such destruction. He relates some gruesome tales of the terrible atrocities committed by the German army and says that numerous scenes he witnessed were pitiable in the extreme.

Duncan Chisholm of Chisholm Corporations, Ltd., Toronto who will erect a pulp and paper mill at Smooth Rock Falls on the Metagami River is at present abroad and is not expected home for several weeks. L. Gray has been up north with a party of engineers for several weeks, examining the site and taking measurements for the company, has returned and is at present in Milwaukee. It is understood that nothing definite will be done until the return of Mr. Chisholm. It is learned that the pulp mill will have an output of about one hundred tons per day and will be erected first, to be followed later by a paper mill of about one hundred and fifty tons daily production of news print.

H. F. Young, who is on the travelling staff of Copp, Clark Company, publishers, Toronto, was in Europe in the interest of the firm at the time the war broke out. While in Nuremberg, he was taken as a prisoner of war by the Kaiser's army along with several other British subjects who will be held as exchanges for German prisoners. Mr. Young has been given some light work about the camp and has been allowed to buy luxuries that are not provided in the ordinary camp fare.

F. H. Gage, former sales manager of the Kinleith Paper Mills, and family who have been spending some time in the Old Country have returned to Toronto. Mr. Gage is now selling representative for several special lines of paper.

C. A. Henderson, who represents Charles Morgan and Company, London, England, was in Toronto and Montreal this week on business? Many of the large paper firms in England are going to send their travellers to Canada during the coming season and although prices have been raised somewhat owing to war insurance, increased freight rates etc., jobbers, who have been handling English tissues, parchments, heavy ledger and other lines, expect to receive their full consignments.

The financial year of the Spanish River Pulp and Paper Mills closed on June 30 and the annual meeting will be held in the near future. Thomas Gibson, of Toronto, secretary of the company who recently returned from a trip to New York, states that the date has not been fixed yet. John G. Sutherland, sales manager of the company, who has been spending a few days in Toronto previous to returning to his headquarters at Dayton, Ohio, reports that all the plants are operating to their utmost capacity.

The Ontario Workmen's Compensation Act, will come into operation on January 1st next, and the making of the system has been completed by F. W. Hinsdale, the expert from Washington. The composition of the board is now complete, being Samuel Price, chairman, A. A. Wright, Toronto, vice-chairman and George A. Kingstone, Toronto. Several meetings have been held and over eighteen thousand manufacturing firms in Ontario will come under the jurisdiction of the Act. Circulars have been sent to all these firms requiring information as to the number of men employed, amount of pay roll, etc., and as soon as this data is at hand the rate for each particular hazard will be struck and the assessments ordered. Some important points have yet to be decided by the Board so that no discrimination will be imposed on any firm.

The Hinde and Dauch Paper Company, Toronto, report that the market for corrugated paper boxes is very good at the present time and that the demand from caners and other concerns is improving. The company are going very extensively into corrugated containers for shipping bread and so far this year have sold over fifty thousand.

Shipments of timber from Northern Europe and the Baltic Sea having been cut off, owing to the war, the British demand for Canadian lumber has increased considerably during the past few weeks. The practical assurance that supplies will be less than requirements has resulted in all round advance in prices. Shippers have in many cases succeeded in cancelling earlier contracts, which will now be put on the market at a considerably advanced figure. Quotations are now higher than those ruling before the outbreak of hostilities. As a result Canadian exporters of lumber to have a profitable season thereby recouping themselves for the low prices at which shipments have been made earlier in the year.



CANADIAN MARKETS

Four branches of the pulp and paper trade, if not more have been distinctly improved by the war and these are the news print ground wood sulphite pulp, kraft pulp and kraft papers. What the effect will be on the other lines cannot be declared with any degree of certainty at the present time. All news print mills are running to capacity and, while the number of foreign inquiries have materially dropped off, and the panicky feeling that at first existed has calmed down somewhat, there is not a plant which could not sell much more than its output. One feature that has developed is that many users are calling for double the storing it wherever they have facilities to do so, and are paying for the deliveries at the time they are made.

Ground wood continues stiff in price and any surplus the mills have, after supplying contracts, they are able to command a good figure for it. Sulphite also remains very firm. Many contracts for news print expire in a couple of months, and it is probable if, at that time, there is no sign of the cessation of the European strife, publishers will have to pay from one-quarter to half a cent more. The exporting mills have all the business that they can possibly attend to, and are naturally marketing their product at the highest possible figure. Owing to the German kraft mills having closed down kraft has taken a big boom in Canada. Kraft pulp has also taken a decided jump.

Book and writing mills are not rushed and, although American manufacturers have raised their prices from five to ten per cent according to the quality of the paper, there has been only one mill in Canada so far that has increased its figures, the advance varying from half a cent to a cent. The others have raised in certain grades only, although all withdrew their quotations several weeks ago. There will be no general raise until present contracts for sulphite and other supplies expire, which will be by the end of the year. Then if raw material holds its present high values, there will be a corresponding augmentation in quotations for the finished products. Several lines of crepe tissue and decorative papers have been advanced by Canadian mills about five per cent, and book and writing mills will, under no circumstances, take orders at present prices and deliver at future dates, but insist that all orders have to be filled and shipped at once. They are taking no chances. Envelopes made from imported English papers have been elevated by the manufacturers by about ten per cent, but this output is not very large, and so far, envelope makers are producing their regular lines at former prices. In all papers where much color is required, ascendant prices are asked and the mills are cutting out colored papers as much as possible.

Paper bag discounts have been reduced from two and a half to five per cent, and the ten per cent, which was formerly given by some plants, on wrapping papers in ear load lots, has also been taken off. Jobbers report that a good business has been done in their various lines during the past month and some are ahead of the corresponding period of last year. English firms, who have been sending certain makes of pa-

per to Canada will, in many instances, continue shipping, although at a higher figure. There has been an advance in practically all classes of rags and paper stock and in roofing stock there is a disposition on the part of certain dealers to hang on to supplies in order to realize the highest figure. Rope bags are in good demand, and certain lines of jute paper are also in much requisition.

Market conditions are, however, settling down to a more normal state, and there is a feeling that things will right themselves providing the war is not too prolonged. Purchasing in most lines is only from hand to mouth and all business, financial, and other institutions are buying only as required. The printing trade is not in as bad a condition as might be expected, as out of the twelve hundred printers in Toronto only about fifty are unemployed, according to the canvass made by the local typographical union. As many order forms, blanks and other printed matter are not being used, however, by manufacturing firms, while insurance companies, banks, etc., are employing cheaper grades of paper in their printed matter. The paper box industry is picking up as a great quantity of package goods are being made for the holidays, and these will replace foreign importations. Several mills are experimenting with certain kinds of papers heretofore imported, and will soon make some interesting announcements, it is expected.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$2.00 to \$2.10 at mill, in earload lots.
 News (sheets), \$2.10 to \$2.20 at mill, in earload lots.
 News (sheet), \$2.25 to \$2.45, depending on quantity.
 Book papers (earload), No. 3, 3.45c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (earload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (earload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c to 8c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.25 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$18.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$48 to \$50, delivered in Canada.
 Sulphite (unbleached), \$50 up, delivered in United States.
 Sulphite (bleached) \$58 to \$59.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.95, f.o.b. Toronto.

No. 1 soft white shavings, \$1.85.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 85c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 40c.
 Old white cotton, \$2.50 to \$2.75.
 Third sand blues, \$1.60.
 No. 1 white shirt cuttings, \$6.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, 90c.
 Flock, \$1.00.
 Tailor Rags, 80c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, ear lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, ear lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

During the interval mills have drawn freely on ground wood supplies on contract and a number of spot orders have been received in the local market at current quotations, \$17.50 to \$18.25 f.o.b. ground wood mill. An announcement was made that a certain pulp mill would like to enter a ten-year contract for a large quantity of ground wood at \$15. f.o.b. mill. With an average 15 cent freight rate the value in New York would be about \$18.40, which is considered too high a price under present conditions.

The sulphite situation is easier than at any time since the outbreak of the European war. Business has been rather quiet. Some pulp arrived at domestic ports from Scandinavia and Rotterdam, but this was for immediate shipment on contract.

The domestic rag market maintained a quiet but firm tone. Exports of rags and paper stock were very small as domestic mills drew on all accumulation early in August. Bagging has been scarce and prices have shown a higher range than for some time. Old genny was quoted at 1¾, f.o.b., New York. The demand for old rope has been active at 3¼ to 4¼ cents a pound, the highest value in a number of years.

Old waste papers have been in fair demand, and prices have been very firm. Soft shavings have been as high as 2.25 as again 1.80 before the outbreak of the war. All grades of flat stock have moved actively on contract, as book mills have been rather short of some grades of pulp that are used for strengthening. Mixed papers have been quiet, but values are firm at 40c to 45c a hundred.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2½ to 2¾ f.o.b. mill.
 Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.
 Bleached Sulphite, domestic, 3c to 3.35c.
 Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
 Easy Bleaching, impt., 2.75, ex dock, New York.
 Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.
 Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
 Kraft Pulp, 2.20 to 2.30 ex. dock, New York.

Paper mills reported in the local market that their output during the month of August was about normal. Most business was done in small orders for meeting the immediate demands on jobbers. The tendency is to hold out for small business for immediate delivery. Writing papers were advanced 5 per cent on grades under 6c in value and 10 per cent on grades up to 15 cents in value by one of the largest manufacturers. Envelope prices were also advanced about 10 per cent by one of the large manufacturers. Reports from newsprint manufacturers show that business has resumed a more normal tone and the feeling is that few publishers will draw ahead of their contract quantities. Business had been so quiet before the war that the heavy extra editions of metropolitan dailies have only made up for losses earlier in the year. As this is the busy time for wall paper printers there has been an active drawing on hanging supplies. Prices have been firm and manufacturers feel satisfied with the business of this year. There is a fair demand for sheet news at 2.35 f.o.b. New York, which is about \$4 a ton above the price quoted before the war. Side runs are in good demand with no available supplies. Wrapping

I. D. Bradshaw, of Bradshaw's Limited, manufacturers of waxed papers, Toronto, is in Winnipeg and other points west on a business trip.

paper mills reported a 20 per cent increase in their output for August as against the output during the same period last year. Prices are firm at an advance of from $\frac{1}{8}$ to $\frac{1}{2}$ cent a pound in all grades. Some book mills have advanced the price in some of the very high grades, and others on some of the low grades. Most of them, however, reported that business has not warranted any advance as yet but orders for immediate delivery only will be taken. All prices have been withdrawn and quotations that will be made on application are subject to change without notice. Specialty houses have followed the same policy, although sharp advances have been reported in some of the colored cover papers. The tissue market showed advances from 40c a ream before the war began to 47 $\frac{1}{2}$ c. There is a poor demand at this price, however. Cigarette papers have been very scarce, and a strong demand has come into the market from large cigarette manufacturers, but domestic mills have not been able to take much of the business as they are now three or four months behind in deliveries. Prices on paper bags were advanced 10 per cent under a good demand. The board business reflected a more active and firmer tone.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side, runs, 2.25.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
 Manila, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.85 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.75 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47 $\frac{1}{2}$ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

PAPER MILL GENEROUS.

The United States residents of the St. Catharines district have united in an American society, partly for the purpose of showing sympathy and giving aid to the British in the present war. The first subscription of \$500 was from the Ontario Paper Company of Thorold.

SWEDISH WOOD PULP TRADE.

According to "Affaivalden" of September 9th, the situation in the mechanical pulp is as follows:

Shipments from the Baltic are now in full swing, but such deliveries are mostly on account of old contracts. On account of the drought and the water-famine there would have been very little unsold in Sweden at the present time, but as France has cancelled a few parcels, these have been available for other markets. No new sales of mechanical pulp have been reported from Sweden and we are also informed that the same can be said about Norway, where the deliveries on old contracts are very heavy.

In the chemical pulps, strong sulphite has been in very strong demand and about 20,000 tons have been sold for prompt delivery during the last 8—10 days. Prices are still rising and as much as £9, clear net f. o. b. Baltic ports extra cash, all commission and discount deducted has been paid for large parcels.

Sulphate is also rising and Kr. 145:—clear net f.o.b. cash payment has been paid for prompt delivery.

BIG SHIPMENT OF WOOD PULP.

The steamer Isthmian, recently cleared, from Seattle is taking as part of her cargo to New York 500 tons of spruce wood pulp from British Columbia. This is the first pulp shipment from British Columbia to the Atlantic coast, and is expected to be the forerunner of many more.

NORWAY WARNS BRITISH PAPER MAKERS.

"Forward," the trade journal of Norway, says, September 12th: "Both branches of the pulp trade are at present quiet. The cellulose section is, however, very strong and prospects are considered very good."

As regards mechanical wood pulp we beg to repeat for the Norwegian mills during the war, our warning to British paper makers not to allow themselves to be persuaded that there will be no difficulties ahead.

CLEARING UP WOOD PULP CASES.

The Board of United States General Appraisers is clearing up the work of making refunds on importations of wood pulp and paper from Europe upon which duty was paid under protest, the Customs Court later ruling that the free entry of Canadian wood pulp and paper under the reciprocity clause was violative of the favored nation clause of our treaties with other countries. There were about 8,000 of these cases before the Board, involving the return of approximately \$3,000,000, and the Board is endeavoring to dispose of the protests before taking up work on cases arising from the new tariff law.

ADDITIONAL WANT ADVTS.

WANTED — Foreman for portable or semi-portable roasting plant in woods. State age, experience, Salary expected, etc. Box 91, Pulp and Paper Magazine, Montreal.

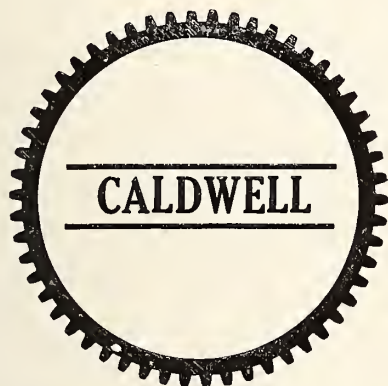
WANTED — Night foreman for mechanical ground wood mill: state experience, references and other particulars. Address "Employer" care Pulp and Paper Magazine, Montreal.

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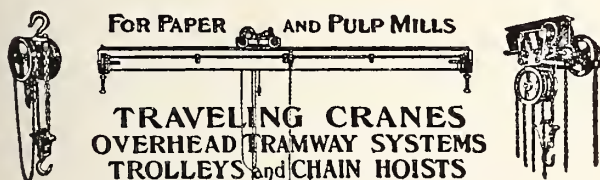
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BATTLE ISLAND PLANT TO REOPEN!

It is reported that the Battle Island plant, which has been closed for some time may be re-opened.

An investigation is being held to estimate the actual cost of producing the sulphite pulp, and a report will be made to the board of trustees by G. C. Webb, who is sounding pulp manufacturers as to the advisability of reopening. Mr. Webb says that double the output of the mill could be sold if it were running.

One feature of the situation is that the action of Canadian creditors in holding up the drive of the company in a Canadian river, will prevent the use of any of the wood cut.

SALE OF PULP TIMBER

SEALED TENDERS WILL BE RECEIVED BY THE MINISTER OF LANDS AT VICTORIA, B. C., NOT LATER THAN NOON ON THE 30TH DAY OF NOVEMBER, 1914, FOR THE PURCHASE OF NINE (9) PULP LICENCES, SITUATED ON THE COAST OF BRITISH COLUMBIA, AND ESTIMATED TO CONTAIN THE FOLLOWING:

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DOUGLAS FIR - - - -	2,779,000

TOTAL - - - - - 205,547,000

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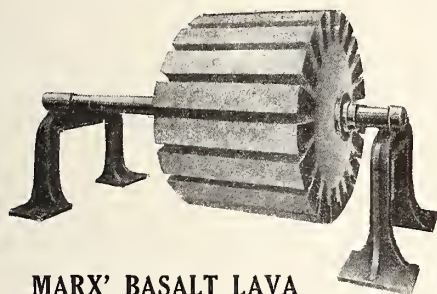
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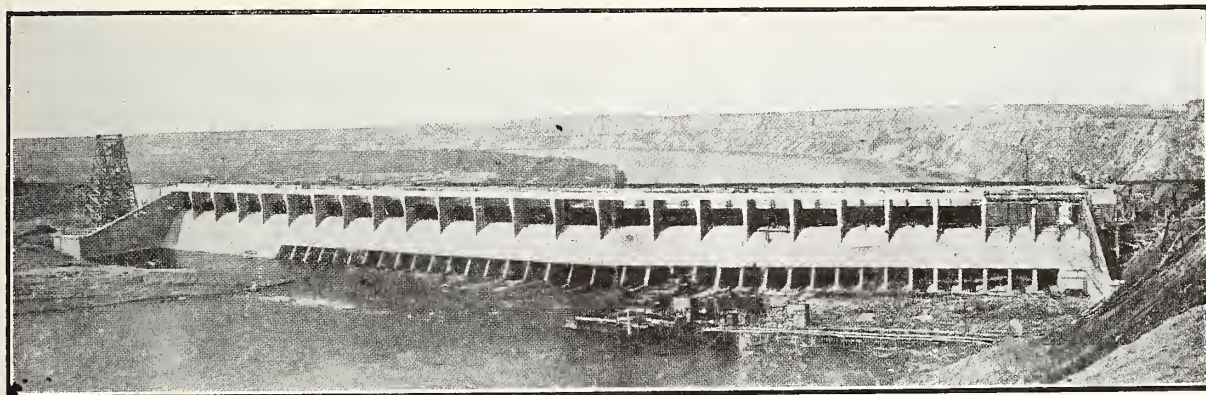
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- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.

MILL SUPPLIES---Continued

- Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Pusey & Jones Company, Wilmington, Del.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.
- Trolleys**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.
- Knives**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.
- Kollergangs**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Pusey & Jones Company, Wilmington, Del.
- Laying Machines**
Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.
- Motor**
Chambers Ltd., 152 Bay Street, Toronto.
- Presses**
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Paper and Pulp Machinery**
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales, Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appieton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.
- Pneumatic Thickeners**
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
Lombard & Co., Boston, Mass.
Stanchile Estates Co., Ltd., Darley Dale, England.
- Pumps**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Pusey & Jones Company, Wilmington, Del.
Smart Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alts**
Boving & Co., of Canada, Limited, Toronto, Ont.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bozner, Albert, 299 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Works, Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Pusey & Jones Company, Wilmington, Del.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glasco, Montreal, Can.

Travelling Cranes

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd., Toronto, Ont.
Smith, S. Morean Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morean Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Tippet, Arthur P. & Co., Montieau, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New-
foundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmias, Dalmias, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B. Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatichouan Falls Paper Co., Ouatichouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, New-
foundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and
Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson,
Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merittton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond,"
"St. Lawrence Bond," "Canada Bond," "Burmese Linen
Ledger," "Windsor Mills Special," "Silverstream," "Spring-
vale," "Super Writing," "White Railway," "Railway Manila."

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and
Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book,"
"Tinted Art Book," "Art Chromo," "English Book," "Satin
Book," "Satin Litho," "Litho Label," "Super S. C. Book,"
"Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

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Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnacona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
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 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



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Ratcliffe Paper Co., Ltd.
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Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 81 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
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Thorne, A. M. & Co., 45 Colborne Street
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Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill

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Andrews, F. H. & Son, 64 St. Paul.
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Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
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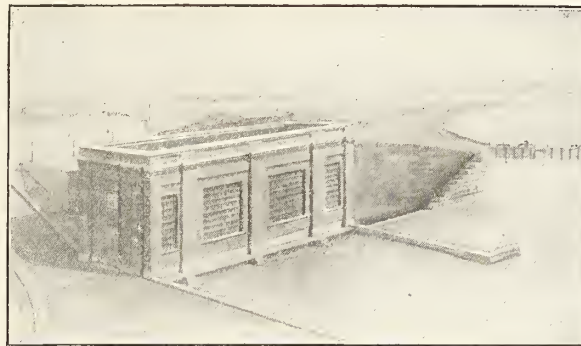
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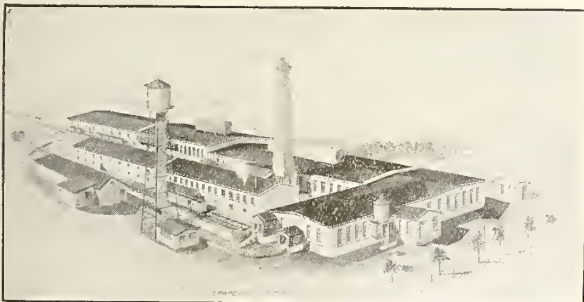
Barber Paper Mill, Georgetown, Ont.



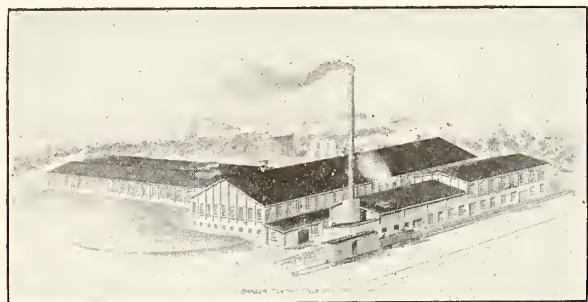
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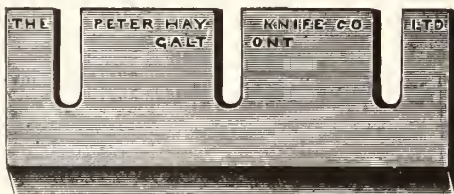
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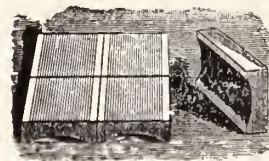
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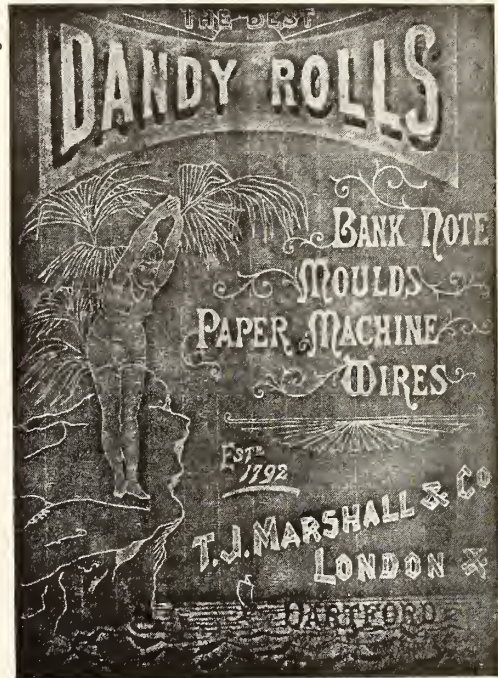
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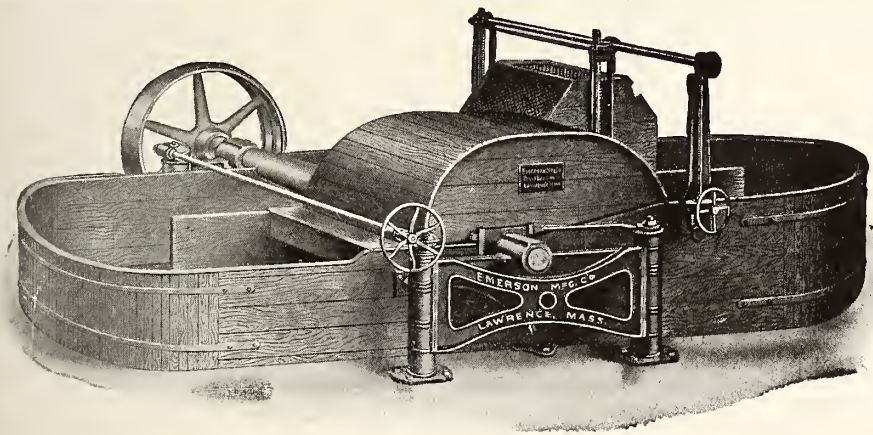
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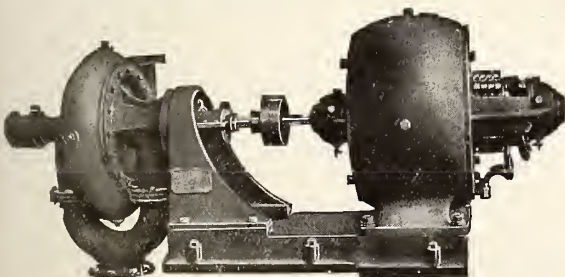
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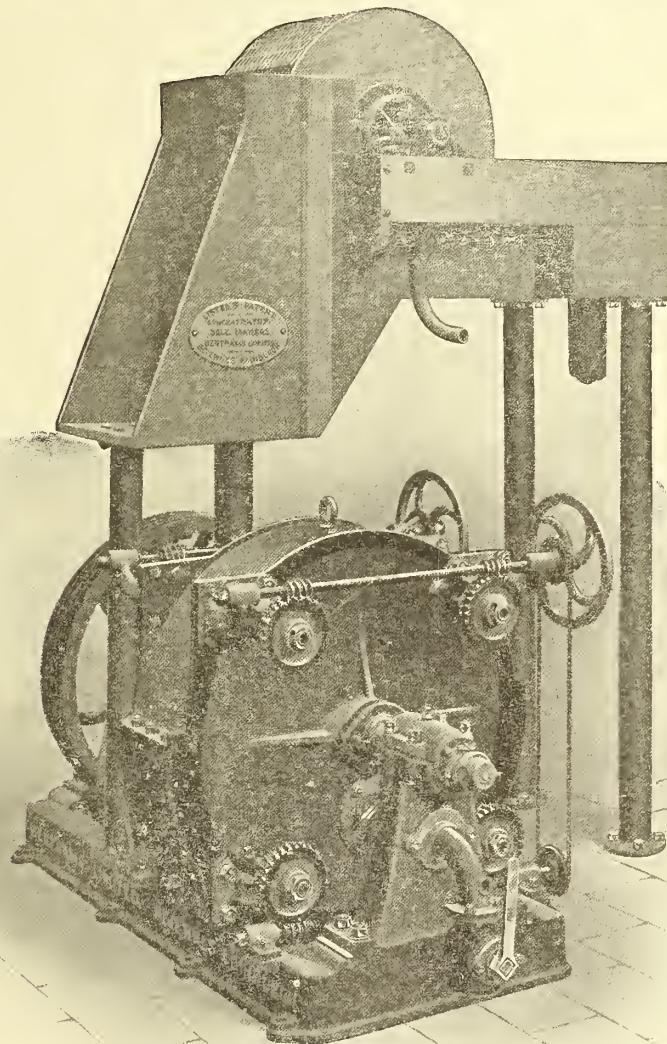
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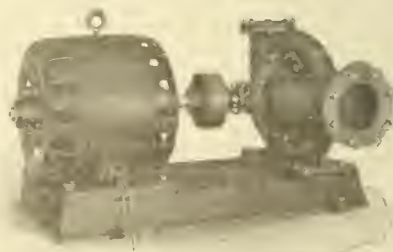
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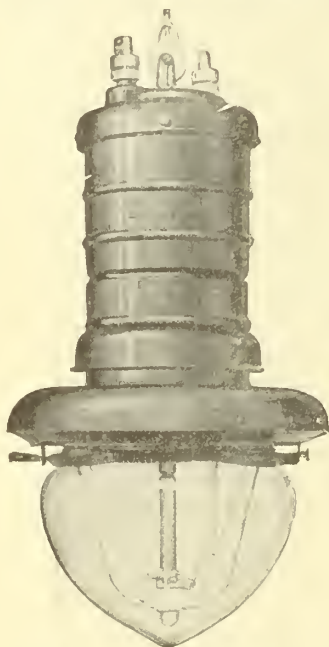
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PULP AND PAPER MAGAZINE OF CANADA

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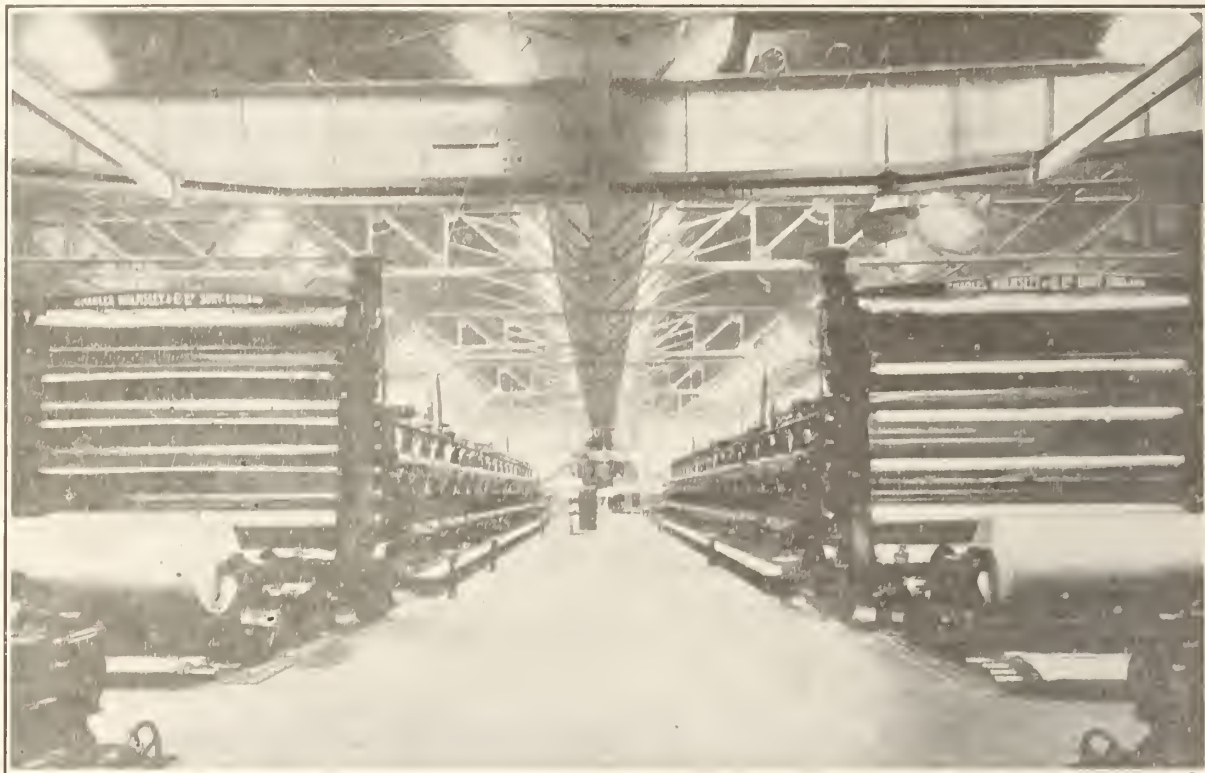
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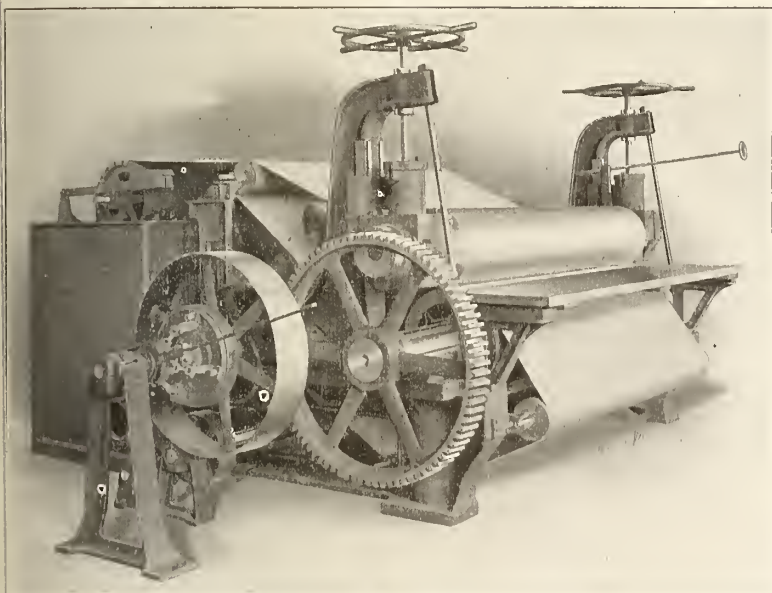
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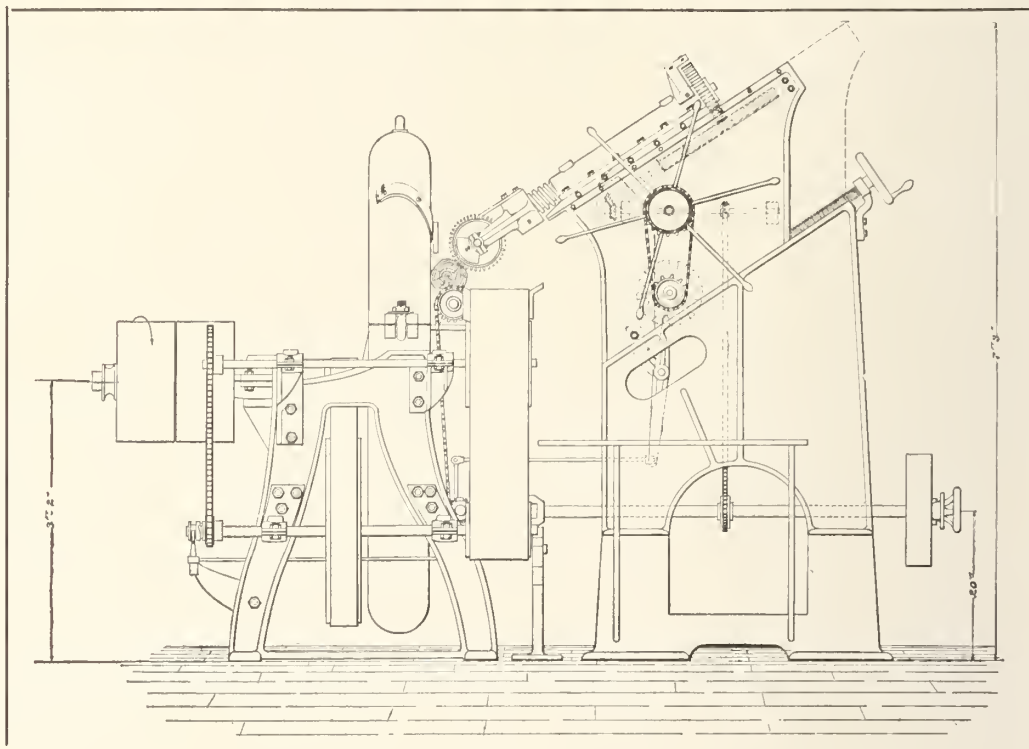
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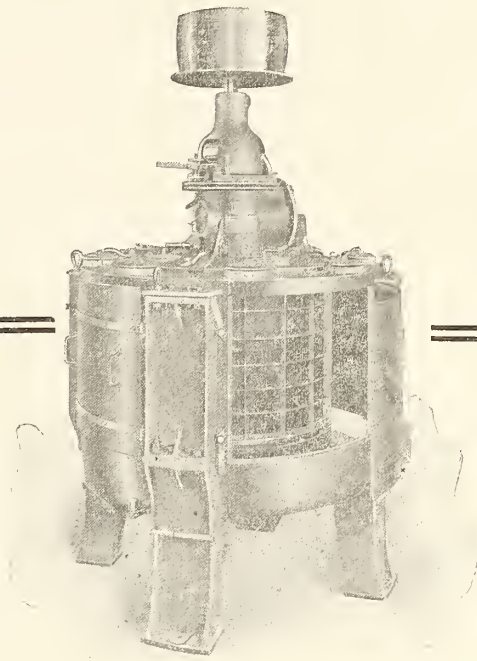
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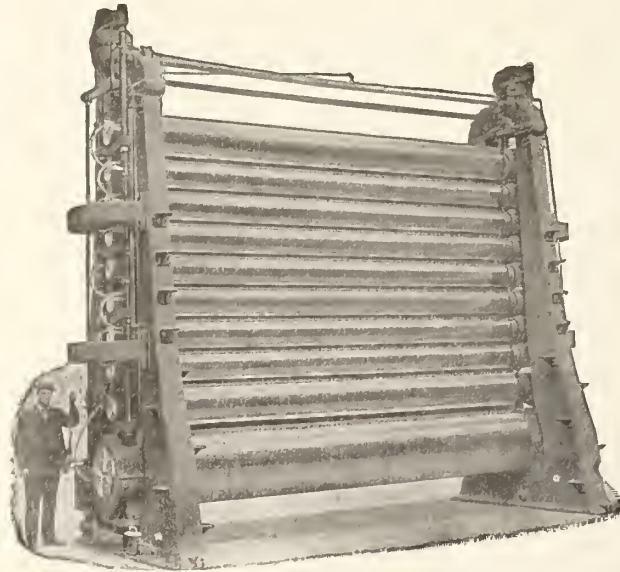
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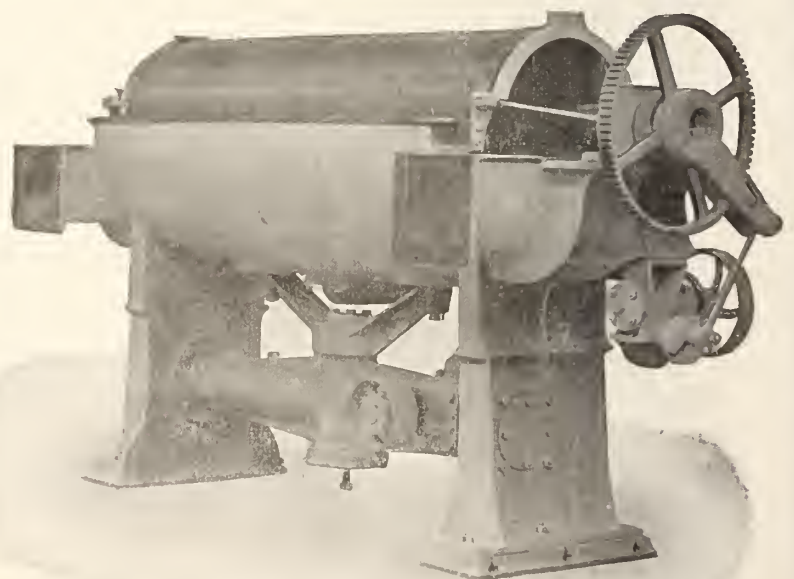
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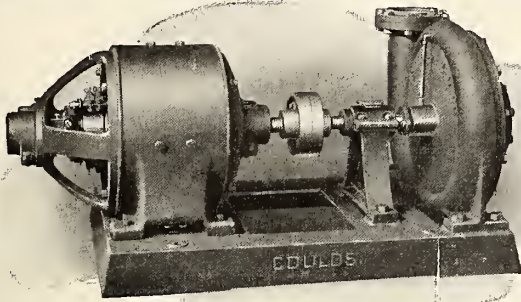
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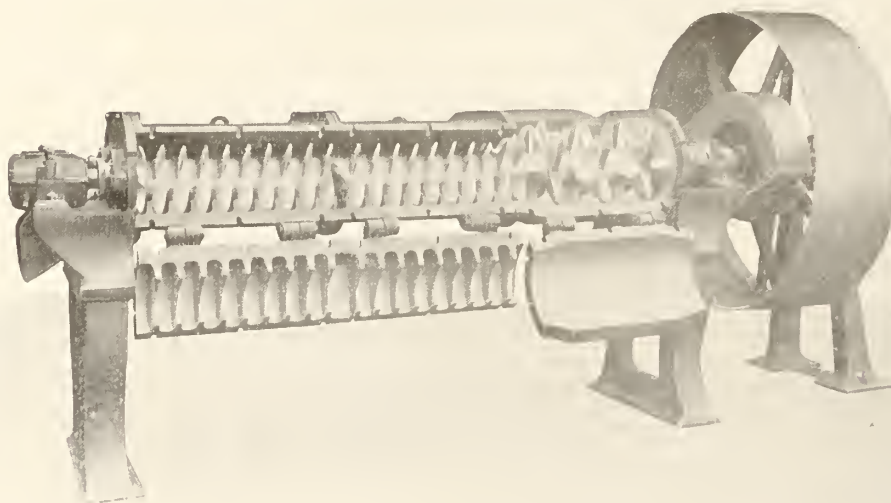
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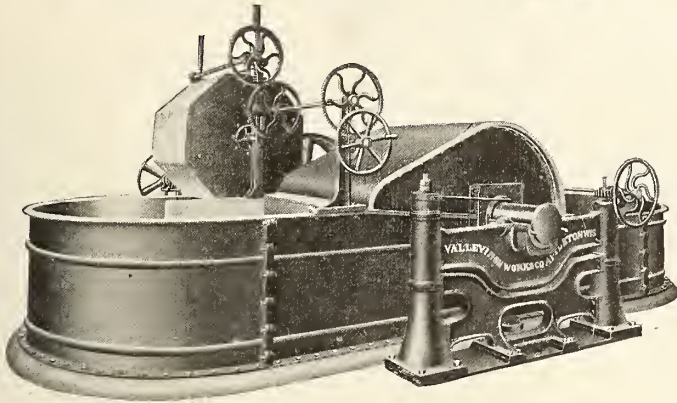
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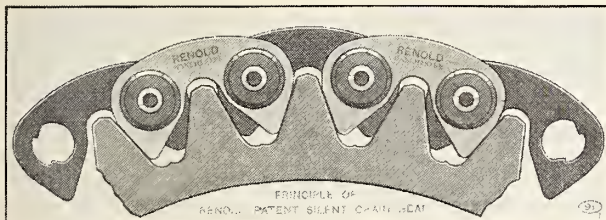
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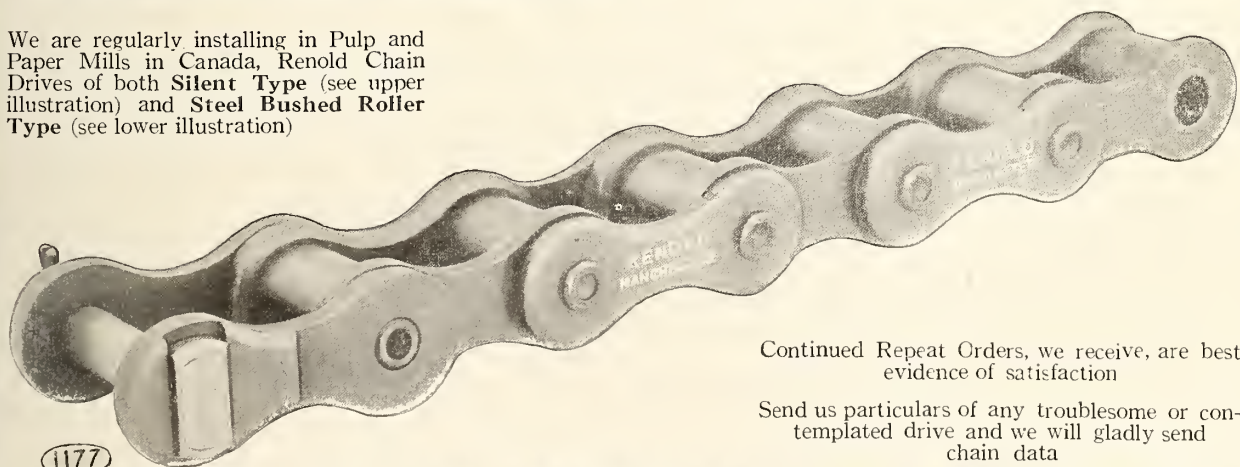
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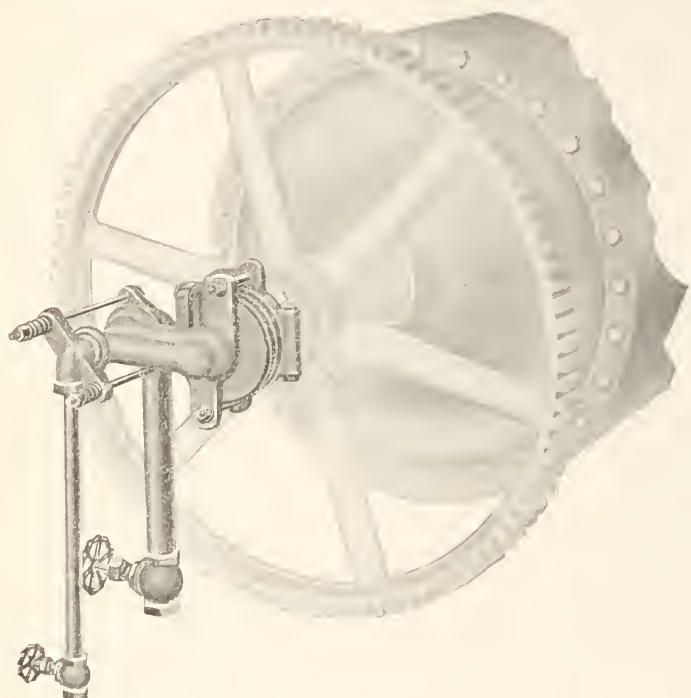
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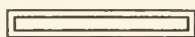
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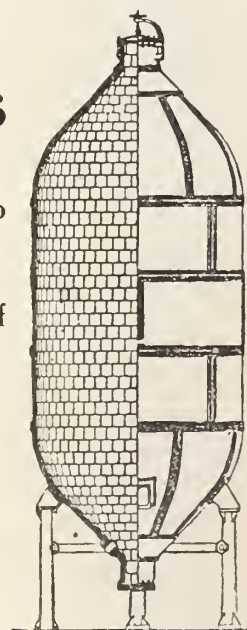
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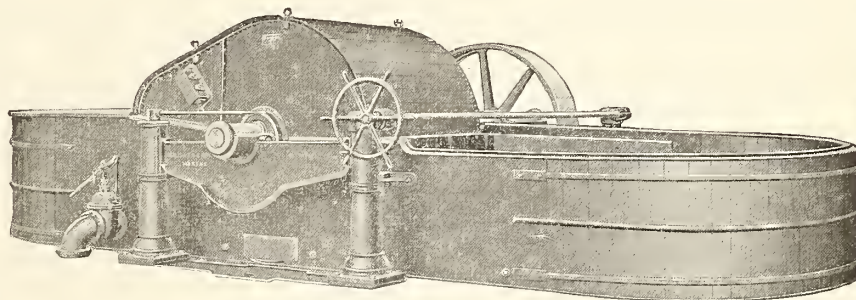


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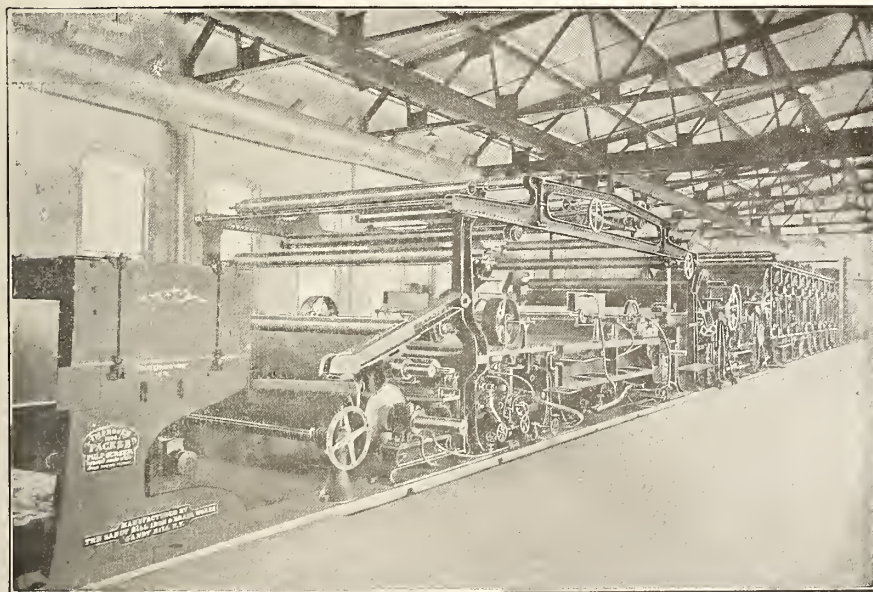


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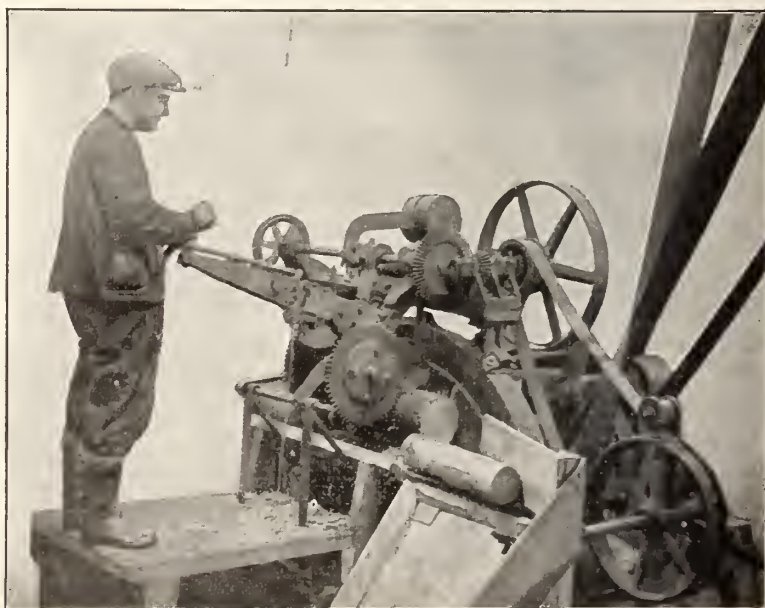
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Pulp and Paper Magazine

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ROY L. CAMPBELL, B.A., B.Sc.F., Editor.

A. G. McINTYRE, B.A., B.Sc., Contributing Editor.

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PROSPERITY SOON.

There will be sore trial yet in Canada through the war. There will be sad gaps in the ranks of our contingents; some industries will be interrupted, and some will be lost. But on the whole, the outlook is bright. When the war came we had passed through a stage of financial hardship, which made the shock more easy to bear, as compared with what it might have been. Had the upheaval found Canada in the midst of the over-development, which was noticeable three or four years ago, there might have been disaster. But we are standing the present troubles well. And after the war, immigration must not only resume, but go rapidly forward. Industries will be favored with markets and capital as never before. After a few more months of trial we should notice the first beams of a new day of prosperity in our land.

HYDROGRAPHIC PROBLEMS.

The present abnormally low water conditions in the Eastern States and on many Canadian rivers gives rise to speculation as to what may happen in times to come when the situation with respect to those powers which are already developed becomes more acute. This it is almost certain to do. While there are no accurate measurements to support the claim, still theory, the experience of other countries, notably the United States, and the observation of engineers in Canada all point directly to the conclusion that the removal of forest cover has interfered with the flow of the streams on which the pulp manufacturer is dependent for his power. And the forest cover is likely to suffer the ravages of fire a great many years yet, unless the temper of the Canadian people and the attitude of the governments changes very quickly.

Already those who are familiar with forest cover conditions on the Ottawa and St. Maurice, our two

chief power streams outside of Niagara, say that the forest fires have undoubtedly made a rapid run-off of water most easy, and that every season these rivers run greater danger of drought and flood conditions, unless some remedial measures are taken. Chaudiere Falls, which used to have a fairly regular flow is showing signs this year of disappearing, and one of the largest producers of pulp and paper in Canada, according to press reports, is facing a pulp shortage because of the lack of power.

If, as it appears, the Canadian public can not see its way clear at the present to spend the money on forest fire protection, then there must be found the funds for an increased number of improvements of a structural nature.

ency at Ottawa city to-day would not be nearly so

Already the Dominion Government has done well in its works on the Upper Ottawa. The power string-serious as it is, had there not been an unfortunate accident in the dam below Lake Temiskaming. The Upper St. Maurice storage scheme bids fair to help out the power developments at La Tuque, Grand Mere and Shawinigan Falls.

The crux of the power question is whether or not the head can be maintained. It is true that there are other important points, such as the distance over which the transformed power has to be transmitted, but that feature to which backers of power developments look to most of all is the minimum head. No chain is stronger than its weakest link, and, generally speaking, no power house is more efficient than its lowest water levels.

There have been stern foreign critics of Canadians' claims to immense power resources. One of these, the French engineer Robert Pitaval, said, after visiting a large number of Canadian plants: "Everything opposes the creation of extensive plants, for instance, the rigor of a long and terribly cold winter . . . and the lack of enthusiasm of capitalists for these en-

terprises, in spite of the encouragement of the Government." After indicating his belief that there will be no further development at Niagara Falls because of an understanding on the part of the United States and Canadian governments, he says: "It seems that Canada cannot be considered a serious danger to the other countries blessed with water-falls. Is not the proof in the failure of electro-chemical and metallurgical industries, which have all the means possible to succeed in Canada."

While Germany has developed 31.2 per cent of its available power, Switzerland 25 per cent and the United States 15 per cent, Ontario has developed 14. per cent, and Quebec 5.7 per cent. The Canadian statistics are derived from a report of the Commission of Conservation in September, 1911. They do not take into consideration, therefore, the most recent developments, such as those on the St. Maurice.

Even Norway and Sweden, which countries are supposed to take a very high stand in electrical works, are below Ontario, with 12.3 per cent and 8.2 per cent of available powers harnessed. But Canada should be able to do far better than at present. In the minds of all who have thought of the matter the conviction that development has really not yet begun is foremost. While it may be true that numerous reasons, economic, intellectual and physical, stand in the way of an early exploitation of a large number of our water-falls, there is still another reason which may be brought out perhaps best by the fact that Germany, Norway and Sweden and Switzerland, where the best development of waterpowers is found, are the countries in which hydrographic services are oldest, and whose studies of the waterpowers are most extensive. This was brought out recently by Mr. Arthur Surveyor, in an article on the waterpowers of Canada in the "Revue Economique Canadienne." Mr. Surveyor argues that what is needed is increased attention to hydrographic surveys, and readings. This is because, he says, there must be placed before capitalists who might invest in power plants, a very accurate knowledge of the possibilities of the various watercourses. Just now, when new projects present so many other problems, it is hardly possible to expect large undertakings when the certain knowledge of the hydraulic possibilities does not exist.

In 1911 Ontario had 46,000 horse-power being developed for the purpose of shaping products of the forest, and Quebec 88,000 horse-power. Leaving out of consideration the great advance that has been made since that time, the two premier provinces of the Dominion have a lead of 6,000 horse-power over the next highest nation, Sweden, which has 120,000 horse-power devoted to manufactures of wood.

We have therefore in Canada much to be proud of, and far more to hope, and the fact that the pulp industry is such an outstanding consumer of power will be in itself a guarantee that the industry as a whole

will stand strongly behind new undertakings along lines of hydrographic measurement, statistics, and professional organization which the various Governments may propose.

The support which has already been given by pulp manufacturers and limit-holders in their private capacity to the Government works will be found indicative of the industry as a whole, and for the purpose of bringing into the fullest use the waterpowers of our land, the members of the pulp and paper industry will do everything in their power.

Forest protection, storage schemes and hydrographic surveying three of the most important works that can be undertaken by our Governments at the present time, will find warm advocates among pulp and paper manufacturers.

THE USE OF PYRITES.

The placing of sulphur upon the list of articles that are contraband of war has placed Scandinavian chemical pulp producers in a peculiar position. The lack of sulphur has seriously impeded the industry in the past few weeks, and it would not be remarkable if an unsettled state of affairs in the naval situation in the North Sea and the Baltic gave Scandinavian sulphite manufacturers a great set back.

This brings up the question of alternative means of producing sulphurous acid in some other way than by burning pure sulphur. A Canadian writer, Alfred G. Wilson, in his report on "The Pyrites of Canada," claims that there can be effected a saving of \$11.35 per hundred kilos of sulphur. Pyrites containing 45 per cent of sulphur can be utilized quite easily, and even those pyrites which have 35 per cent can be used, if, according to the new process of Buddeus there is also 0.8 per cent to 1 per cent of copper also contained in the residue after the burning. The process can be used on small quantities of material, and intermittently. The cost of treating is said to be very low, from \$2 to \$3 a ton. There are many pulp mills in Europe using the process.

There has recently been advanced a proposal which would seem to make the pyrite process still more valuable. It is that out of the ores there may be extracted by simple washing sufficient copper and sulphur to make the operation very profitable, even when there is only 0.30 to 0.5 per cent of copper. The iron residues are more useful when these two have been taken away, and can be sold to advantage. The copper, which is extracted as a sulphate can be obtained from the washing water by the addition of old iron, which causes the copper to be precipitated as a fine red powder, which is usually about 90 per cent to 92 per cent pure. The sulphate of iron solution obtained may be used in the manufacture of dark colored papers, or sold crystallized as sulphate of iron. Even as an aid to the production of clean grain through its antiseptic qualities, it is of value.

EFFECTS OF VARYING CERTAIN COOKING CONDITIONS IN PRODUCING SODA PULP FROM ASPEN¹

By HENRY E. SURFACE, Engineer in Forest Products, Forest Products Laboratory, U.S. Dept. Agriculture.

(Concluded from October 1st issue. — Reference Notes on Page 604.)

The apparatus employed in cooking is shown in Fig. 1. Fig. 2 shows diagrammatically the course of the material through the various stages of treatment and testing, and in this way the relation of one part of the procedure to another is made clear.

After the amount of moisture in the chips had been ascertained by means of sample A, the charge was weighed out and put into the digester. Caustic soda solution, of the desired concentration and volume, had been prepared by diluting the necessary quantity of analyzed stock solution (sample B) with water. It was then heated to the charging temperature and run into the digester, and the cooking operation was begun by permitting live steam to enter at the bottom.

During the cooking, observations were made at 15-minute intervals of (1) digester temperature, (2) digester pressure, (3) steam pressure at digester inlet, and (4) room temperature. The volume of liquor in the digester was also observed, but at hourly intervals. These observations were recorded, and a graphic "log of cook" was made at the same time, an example of which is shown in Fig. 3. If at any time the digester temperatures and pressures as observed on the thermometer and pressure gauge did not agree

During the first hour of cooking the digester pressure and temperature were brought, at a uniform rate, up to the maximum to be employed, and were held constant at this value during the remainder of the cook. At the end of the cooking period the top relief vent was opened and the digester pressure quickly "relieved" until "blowing pressure" was reached, when the vent was closed, the two blow-off valves were opened, and the digester was emptied under blowing pressure with the assistance of a steam ejector in the blow-off line.

The pulp was caught in the blow pit, where it was washed with three or more 50-gallon applications of hot water. After the blowing and after each successive washing the pulp was allowed to drain, and the drainings were pumped to the black-liquor storage tank. The washing operations were continued

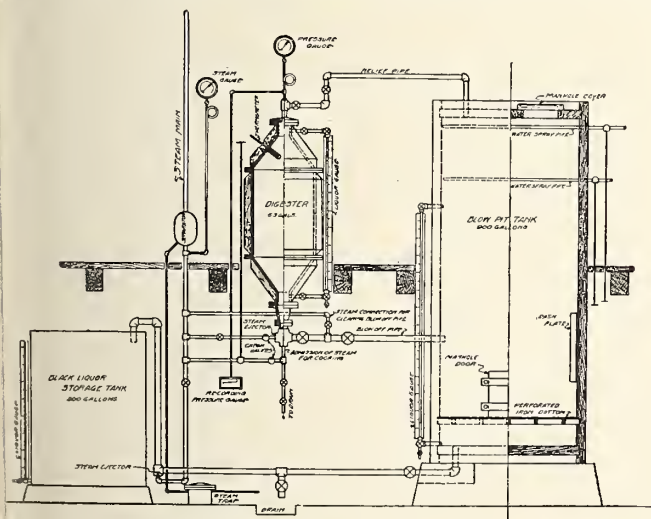


Fig. 1.—Experimental equipment for cooking by the soda process.

When compared by means of pressure-temperature tables for saturated steam, the excess of pressure was relieved; such a condition occurred as a rule only during the first hour of cooking. The room temperature and the pressure of steam at digester inlet were kept as near constant as possible for all the tests, so that all conditions affecting condensation, aside from the cooking itself, would be uniform. For the same reason, steam of approximately the same moisture content was used in all tests.

¹This paper presents detailed information of value in experimental work in the laboratory and in promoting the efficiency of commercial paper-making plants employing the soda process.

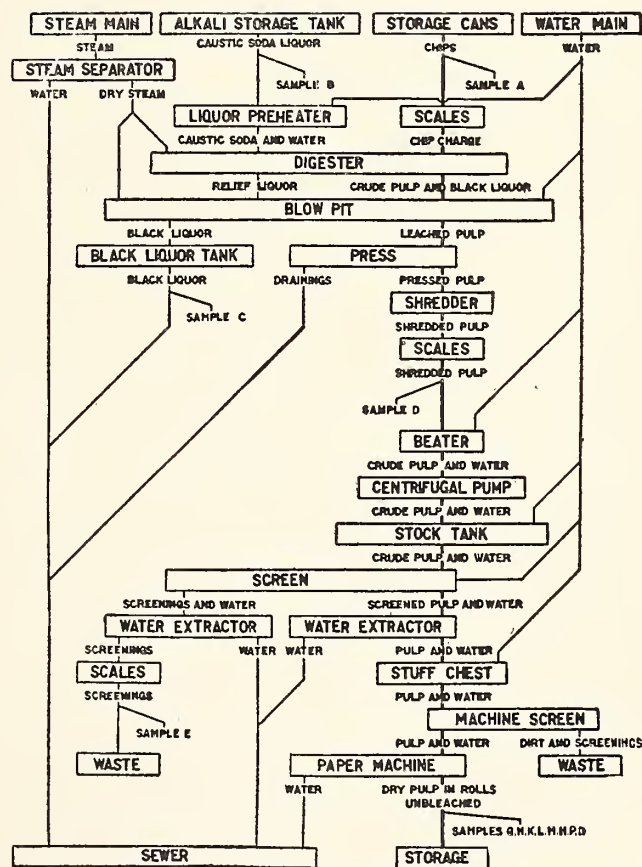


Fig. 2.—Flow sheet, showing course of material through the various stages of treatment and testing.

until the last drainings were of a specific gravity lower than 1.003 at 22 deg. C. Inasmuch as the top relief pipe emptied into the blow pit, it was possible to collect the small amount of relief liquors, together with the black liquors, in the storage tank, where the volume of the whole was read off on the graduated tank gauge. A sample of this (sample C) was secured

for analysis, and the amount and character of the recovered chemicals determined (Fig. 2).

After the last washing the crude pulp in the blow pit was drained as dry as possible and, by means of scoops, removed to a strong linen bag inclosed in a perforated metal cylinder. The pulp in this form was then placed under a 70-ton, knuckle-joint, power press. After being pressed to about 30 per cent bone dry the pulp was next "opened up" in a swing-hammer shredder running at low speed and without a cage, so that the largest lumps after shedding were about hazelnut size. This was done to facilitate sampling and increase the accuracy of the dry-weight determinations. The shredded pulp was weighed and sampled (sample D) for determining the dry weight. It was then mixed with water and further opened up in a 25-pound Hollander-style beater, with the roll well off the bedplate so that no real beating could take place, and was pumped from the beater to a 200-gallon stock tank at the head of the screening system,

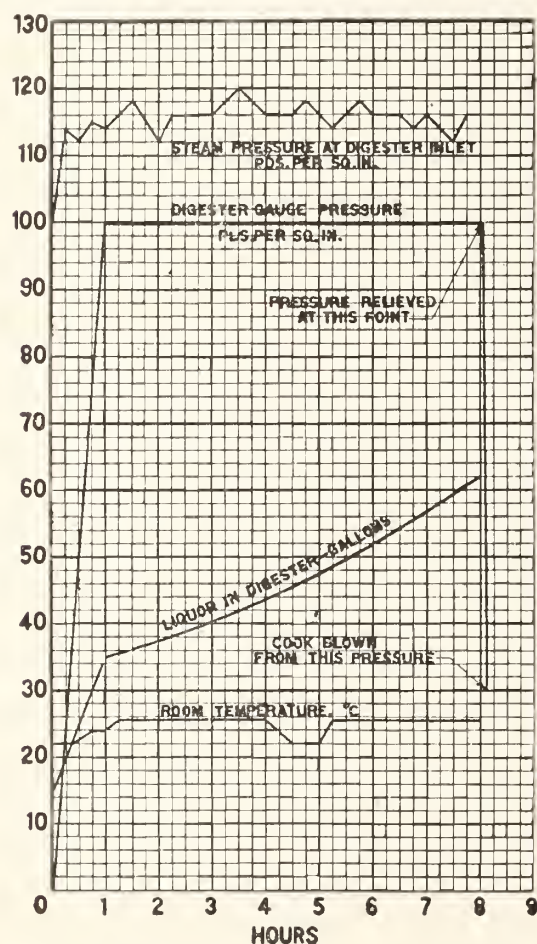


Fig. 3.—Typical graphic log of cook.

where it was diluted with water to a known volume. This mixture was then screened by means of a 6-plate diaphragm screen with slots 0.009 inch wide. The screenings which went over the plates were then collected, weighed, and sampled (sample E), as described for the crude pulp. The screened, unbleached pulp which went through the screen slots, mixed with a large amount of water, was run to a water extractor and concentrated. Afterwards it was pumped to the paper machine stuff chest, made up to a known volume with water, pumped to the machine screen (diaphragm type, 0.012 inch slots), and run out on a 15-inch Fourdrinier paper machine (see Pl. I.), into a sheet 10 inches wide by about 0.010–0.011 inch thick.

The rolls of the screened, unbleached pulp thus secured were stored awaiting the tests to determine its properties for which samples G to R were taken. Where the screenings were so large in amount as to preclude accuracy of sampling the crude unscreened pulp, such pulp was screened without the preliminary pressing, shredding, etc., and the screened pulp was collected on a 70-mesh sieve, pressed, shredded, weighed, and sampled for the yield determinations. The pulp was then screened again and made up into a sheet as described.

The methods used for determining dry weights, yield, quality of pulps, and composition of liquors are given in the appendix. (Appendix not given.—Ed.)

Test Material Used—Wood.

The test material consisted of 31 logs of aspen (*Populus tremuloides*, Michx.) cut from representative trees growing intermixed with white birch near Rhinelander, Wis. The trees were of seed growth, and had attained an average height of 44 feet, with straight, clear lengths of about 22 feet from which the logs were cut.

The ages of the logs varied from 28 to 42 years, as determined by counting the annual rings. The logs were fairly free from knots, considering the size of the trees and the species. Volume-weight determinations on 36 samples, representative of the whole shipment, showed the average bone-dry weight per cubic foot of green or unseasoned wood free from knots to be 26.68 pounds. The samples ranged from 23.6 to 31.4 pounds per cubic foot.

As a rule, the test material was sound, but some of the logs had decayed hearts. The material was peeled by means of a carpenter's drawknife; all decayed portions on the outside of the pieces and all protruding knots were chopped off. This cleaned wood was then sawed into disks five-eighths inch thick in the direction of the grain. Butts, tops, and all disks containing decay or other defects were culled.

The remaining sound disks were split with the grain into chips 1 inch to 6 inches by one-fourth inch by means of a special guillotine chipping machine. All knots were culled. The chips were then seasoned to constant air-dry weight, thoroughly mixed and screened to remove sawdust and dirt, and finally stored in cans to await the cooking tests.

Cooking Chemicals and Solutions.

In ordinary mill practice the soda cooking liquors are made as previously described. The freshly causticized solution contains caustic soda (NaOH) for the most part, but a small amount of soda ash (sodium carbonate, Na_2CO_3) still remains uncausticized. Various impurities are also present, but these are considered to have no effect in cooking.

In the experiments the cooking solutions were made by dissolving fused caustic soda, 76 per cent sodium oxide (Na_2O), in water. The resulting solution was similar to the solution used in commercial practice so far as caustic soda and soda ash are concerned, and there is no reason to believe that the results should be different in any way from those which would have been obtained by the use of commercial liquors of the same concentration and causticity.

Effects of Variations in the Cooking Conditions.

The influence of the variable cooking condition in each group of tests on resultant yields and properties of pulps and consumption of cooking chemicals is shown graphically in figures 4 to 15.¹⁸ While, in gen-

eral, the tests were carried out in accordance with the plan which has been described, minor departures could not be avoided, and the location of certain points on the diagrams are more or less affected by such variations. For this reason the tabulated data should be consulted for the exact conditions of each cook.

Yields.

The effects on yields of pulp and screenings are expressed by the curves in Fig. 4, in which the yields are plotted against the amount of caustic soda, the duration of cooking, the pressure of cooking, and the initial concentration of caustic soda.

Amount of Caustic Soda.

With increases in the amount of caustic soda per pound of wood the yield of total crude pulp decreased at the rate of about 1 per cent for each 2 per cent of caustic (0.02 pound NaOH per pound of wood). The yield at zero caustic soda would probably fall between 80 and 90 per cent, being influenced only by the cook-

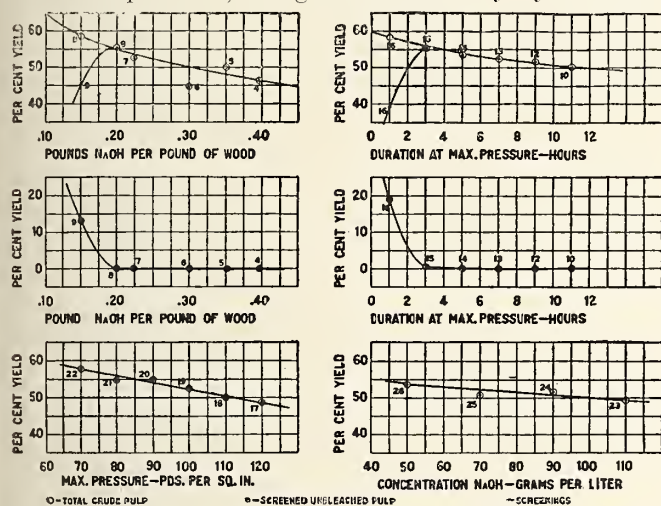


Fig. 4.—Effects of cooking conditions on yields of total crude pulp, screened unbleached pulp and screenings.

ing effect¹⁹ of the water condensed from the steam used in cooking. For high amounts of caustic soda the curve tends to approach parallelism with the horizontal axis. The yield would not be expected to become zero unless exceedingly large amounts of caustic were used.²⁰

For amounts of caustic soda above what may be considered the minimum for successful cooking under the conditions used, the yield of screened unbleached pulp was identical with that of crude pulp, but for smaller amounts of chemical it rapidly approached zero, while under the same conditions the screenings curve naturally approaches and becomes coincident with the curve for the total crude pulp. In this group of tests the minimum amount of caustic soda for successful cooking, so far as yields alone are concerned, is somewhere between 15 and 20 per cent.

Duration of Cooking.

The duration of cooking at maximum pressure influenced the yields in very much the same manner as did the amount of chemical. The yield of total crude pulp decreased about 1 per cent for each additional hour of cooking at maximum pressure. However, the curve (Fig. 4) seems to approach parallelism with the horizontal axis, thus signifying that beyond a certain point cooking would have had no further effect.²¹ The time allowed for these cooks to reach the maximum pressure was one hour, and the extended curve indicates a yield of about 60 per cent for zero hours duration at maximum pressure. This shows that the

greater part of the cooking was accomplished during the first hour, or before the maximum pressure was attained, since during that hour about 40 per cent of the wood substance had been dissolved and the dissolving effect during the next 12 hours was only one-fourth as great.

As determined by the yield curves, the minimum duration for successful cooking under the conditions employed was between one and three hours at maximum pressure. No tests were made between these two points.

Pressure of Cooking.

The curve showing the influence of maximum cooking pressure or temperature on yields indicates that all of the tests were made at pressures above the minimum required for successful cooking, under the conditions employed for these tests; hence, no screenings were obtained from any of the cooks, and the curve for screened unbleached pulp coincides with that for total crude pulp. Increases of pressure from 70 to 120 pounds per square inch resulted in decreasing the yields of pulp about 1 per cent for each five pounds which indicates that the higher pressures increase the thoroughness of cooking, other conditions being constant.

Concentration of Caustic Soda.

The tests varying the initial concentration of caustic soda in the digester liquors were also made within limits that resulted in thorough cooking for all of the tests. Increasing the concentration under the conditions employed resulted in decreasing the yields

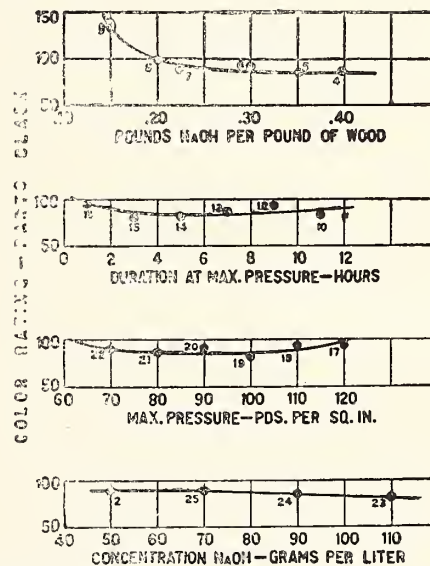


Fig. 5.—Effects of cooking conditions on the color (parts black) of pulp.

of pulp about 1 per cent for each 13 grams per liter increase in concentration. It is thus evident that with a given amount of chemical the greater cooking effect is secured by means of the more concentrated solutions. A practical limit, of course, exists at the point where the volume of the digester liquor becomes too small to afford favorable cooking conditions.²²

Properties of Unbleached Pulps—Natural Color.

Curves indicating the effects of the conditions of cooking on the natural color of the unbleached pulps are shown in Fig. 5.

The larger the amount of caustic soda used per pound of wood the lighter in color was the pulp, as indicated by the "parts black" color rating, but the curve approaches parallelism with the horizontal axis

as the amounts of caustic increase. White pulps or those with zero "parts black" would not be obtained even if exceedingly large amounts of chemical were used.

Longer periods of cooking produced lighter-colored pulps up to the point where the maximum yield of screened pulp was obtained. Beyond this point there was a tendency for the pulp to become slightly darker as the duration of cooking was increased. This was probably due to the pulp fibres absorbing and retaining coloring matters from the "black liquors." It is generally believed that as the cooking becomes more thorough the cellulose of the fibres gradually becomes more gelatinous or hydrated, and would therefore tend to retain coloring matter during the subsequent leaching and washing treatments.

The pressure (temperature) of cooking seems to have had comparatively little effect on the color of the pulp within the range investigated.

The more thorough cooking resulting from the higher initial concentrations of caustic soda produced lighter-colored pulps, although the lower limit of the cooking condition in these tests was considerably above the minimum for successful cooking.

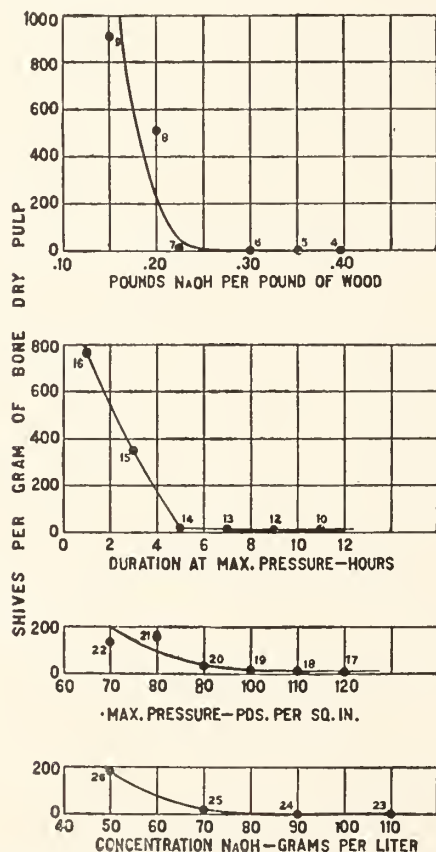


Fig. 6.—Effects of cooking conditions on the occurrence of shives in pulp.

While the several curves shown in Fig. 5 indicate for each group of tests more or less change in the "parts black" color ratings or the depth of color, the hues of the pulps were not materially affected.

Occurrence of Shives.

Shives are most numerous in pulps from the less severe cooks and are entirely absent from those thoroughly cooked. The shives curves (Fig. 6) bear some resemblance to those for the yields of screen-

ings, but shives disappear from the pulps only under somewhat more severe cooking conditions than those which reduced the yield of screenings to zero. At the point of maximum yield of screened pulp the cooking has progressed far enough for the fibres to become more or less separated from each other, but not completely so, since some of them still remain in groups (shives) small enough to pass the screen slots. But as the cooking becomes more severe the fibres are entirely separated, and the resulting pulp is free from shives. In general, increasing the amount of caustic soda, the duration or the temperature of cooking, or the initial concentration of the digester liquor decreases the "shiviness" of the pulp.

Ash Content.

The curves in Fig. 7 indicate that increasing the thoroughness of cooking within certain limits decreases

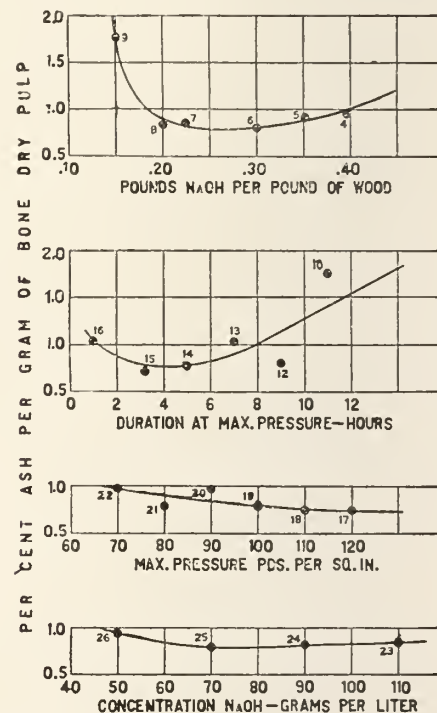


Fig. 7.—Effects of cooking conditions on the ash content of pulp.

es the ash content of the pulp; outside of these limits the ash content may be increased.

Since the normal amount of ash in aspen wood is no over three-quarters of 1 per cent, the high amounts in the pulps produced from this wood in some of the tests is probably due to the presence of cooking chemicals²³ which were not completely removed during the washing treatments. Increasing amounts of ash at the cooking conditions become more severe may be due to a difference in physical character of the cellulose produced under such conditions and the resultant increased difficulty of leaching out and washing away any residual and absorbed mineral matters. No tests were made to determine the character of the ash from any of the pulps.

Strength.

The strength of a pulp depends chiefly upon three factors—(1) the strength of the individual fibres; (2) the felting or matting quality of the fibres; and (3) the presence of gelatinized fibres and other matters which act as cementing materials.

Severity of cooking is attended by a weakening of the cell walls and may result in a decrease in the strength of the pulp. This decrease of strength was strongly marked in the tests in which the more severe cooking conditions were produced by increasing the amount of caustic soda. It was most rapid up to the point where the fibres were completely separated (indicated by the absence of shives), beyond which it was less pronounced. For increasing durations of cooking the general trend²⁴ of the effect was the same as for increasing amounts of chemical, but the total decrease in strength was not quite so great in amount for the range of cooking conditions investigated.

Increasing the pressure and increasing the initial concentration beyond a certain point both increased the strength of the pulp. This effect is apparently contradictory to that found for the other two groups of tests and may possibly be due to the high temperatures and high concentrations which would tend to cause

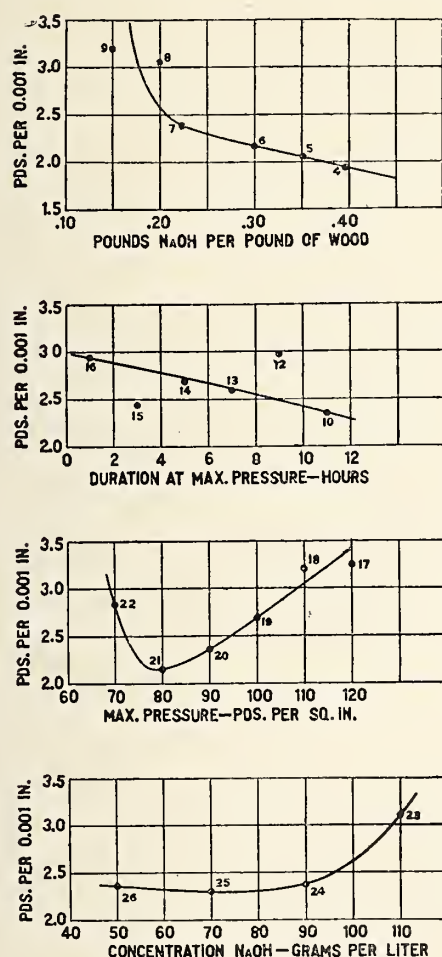


Fig. 8.—Effects of cooking conditions on the strength of pulp.

a physical change in the cellulose with increase of the cementing effect mentioned previously.

Curves showing the influence of cooking conditions on the strength of pulp are given in Fig. 8.

Ease of Bleaching.

The chief purposes of bleaching are (1) to produce a white pulp and (2) to destroy any non-cellulose materials which tend to make the pulp less durable. The more nearly the original pulp approaches to pure cel-

lulose the less is bleaching required. However, difficulty of bleaching is occasioned not only by the presence of ligneous matters, but also by coloring matters absorbed in the cell walls from the "black liquors" and by the residual cooking chemicals which the leaching and washing treatments have failed to remove. In the latter case a certain amount of bleach is neutralized by reactions with the other chemicals.

Curves expressing the effects of varying the cooking conditions on the ease of bleaching, as measured by the amount of bleach required to bring the pulps to a standard white color, are shown in Fig. 9. These curves show that under the conditions of cooking the residual ligneous matters are the most important factor in determining the amount of bleach required, since the more thorough cooking produces pulps that are more easily bleached. The decrease in amount of bleach required was very rapid up to the point where shives were eliminated; beyond this point the effect was less marked. It must not be assumed that the shives alone necessitated the larger amounts of bleach. The

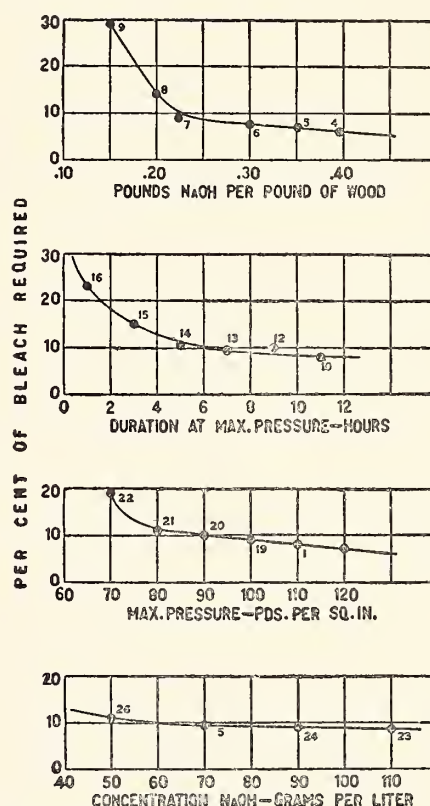


Fig. 9.—Effects of cooking conditions on the ease of bleaching.

presence of shives indicates an incomplete cooking reaction and implies that considerable ligneous matter may remain in the other (completely separated) fibres.

The effect of severity of the cooking conditions is especially noticeable in the curves for the tests varying the amount of caustic soda and the duration of cooking, since certain of the pulps produced in these tests were less thoroughly cooked than any of those from the other groups.

Loss on Bleaching.

The curves showing the losses on bleaching as affected by the varying cooking conditions are given in Fig. 10. As would be expected, the loss decreased with thoroughness of cooking. In the tests varying the amounts of chemical and the durations of cook-

ing the rate of decrease in bleaching loss with greater severity of cooking was fairly constant, but it is probable that if the cooking conditions were extended for higher values than those used the curves would approach parallelism with the horizontal axis. Such an effect was obtained for the tests in which the cooking pressures were varied. It is not reasonable to believe that more severe cooking would result in pulps which would suffer no loss whatever on bleaching.

Table 4.

Cook No.	Concentration of NaOH.	Yield of total crude pulp.	Yield of screenings.	Bleach required.	Loss on bleaching.
	Grams per liter.	Per cent.	Per cent.	Per cent.	Per cent.
1	80	41.10	0.10	15.4	3.92
2	50	44.23	.03	14.7	4.08
4	30	46.97	.07	15.8	4.68

Each cook employed seven hours' duration at 110 pounds pressure per square inch. The caustic soda charged amounted to 0.25 pound per pound of wood. For complete information see appendix, Table 15.

The platted points for the tests in which the initial concentrations were varied are so few in number and so irregular in location that they give little indication of the influence of this factor. However, additional information is obtained from some earlier tests of the Forest Service, summarized in Table 4.

These data indicate that increasing the concentration reduces the loss on bleaching, hence the curve in figure 10 has been drawn to show such an effect. This is substantiated by the fact that varying the amount of chemical and the duration and pressure of cooking in each case showed a reduction in the

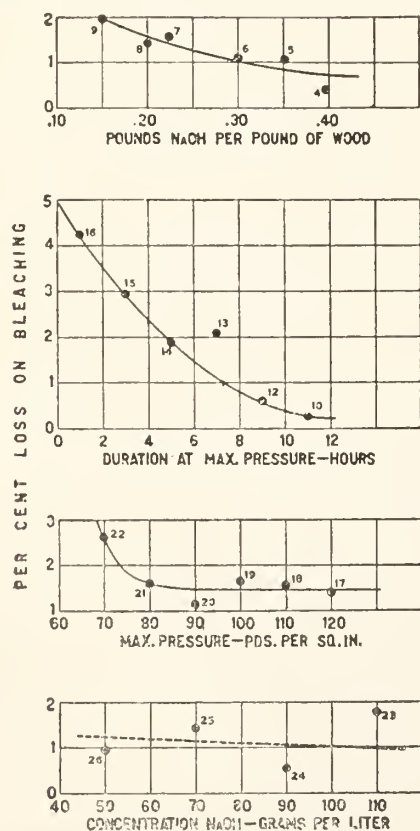


Fig. 10.—Effects of cooking on the bleaching loss.

bleaching losses as the severity of cooking increased, and that most of the other curves for the effect of concentration (especially the yield, shives and bleach-

required curves) show more severe cooking with the higher concentrations.

The relatively large amount of loss in the case of cook 23 does not seem to be warranted in view of the well-cooked condition of the pulp. However, the comparatively high strength of the pulp indicates an abnormal condition.

The loss in weight of a pulp during bleaching is due primarily to the removal of the colored lignous matters and to the partial destruction of the cellulose itself. The matter is especially liable to occur if the bleaching treatments are severe, or if the cooking treatments have left the cellulose in an easily oxidized condition, so that it is either dissolved during bleaching or broken up into small particles, which are removed in the washing operations. The partial removal of the mineral or ash-forming constituents from the pulp may also occasion some loss. On the other hand, the ash in bleached pulp sometimes tends to increase over that for the unbleached pulp (due to an accumulation of lime compounds and other residues from the bleaching solution), and hence may offset the loss due to other causes.

Relation Between Properties and Yields.

Many of the curves expressing the effects of the varying cooking conditions on the properties of the unbleached pulps have bends or "breaks" at or near the values for the cooking conditions which result-

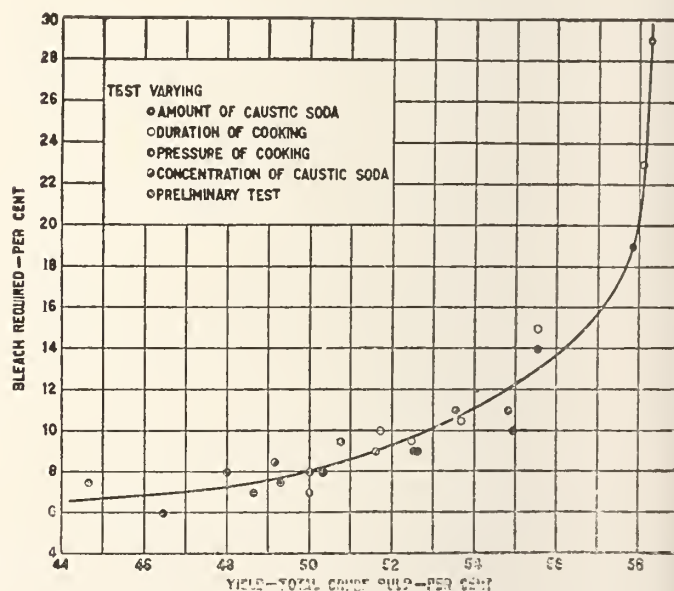


Fig. 11.—Relation between yields and ease of bleaching.

ed in the highest yields of screened pulp. So general is this that, with decreasing severity of cooking, the occurrence of sudden changes of direction for curves expressing properties affords a reliable indication that the yield of screened unbleached pulp is near its maximum. This is especially evident in the curves for ease of bleaching.

That properties of pulps are directly dependent upon yields is well illustrated when amounts of bleach required are platted against yields of total crude pulp, as in Fig. 11. Values for all of the cooks made in these experiments have been platted, irrespective of the testing condition under which they were secured. It is evident that cooks which resulted in decreased yields

produced easier bleaching pulps. For the higher values slight differences in the case of bleaching, but the effect rapidly diminishes until a large decrease in the yields affords little difference in the amounts of bleach required. This would be expected in view of the nature of the cook reactions. The effect is first to remove the intercellular substances and part of the ligneous matters from the wood, then the cellulose itself begins to be attacked, and finally, after the greater part of ligneous matters has been removed, the cellulose alone is affected. The ease of bleaching is a measure of the amount of non-cellulose matters present in the pulp.

Other properties of the pulps when similarly platted against yields show more or less definite relationships,

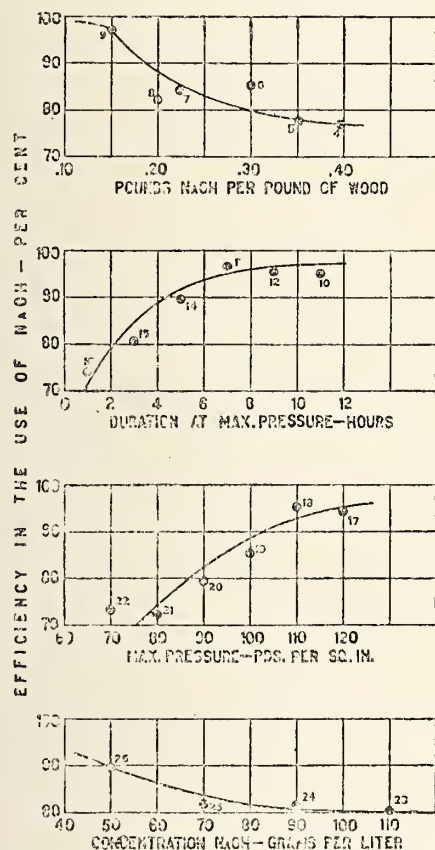


Fig. 12.—Effects of cooking conditions on the efficiency in the use of caustic soda.

but are apt to be modified according to the cooking condition varied. For instance, when varying the amount of caustic soda or the duration of cooking, decreased yields were attended by decreased strength of pulp; when initial concentrations or pressures were varied, the strength increased as the yields decreased. Natural color, shives, and screenings, however, were little affected for yields below 54 per cent., no matter how produced; for higher yields the color, shives and screenings increased rapidly with increasing yields. The losses on bleaching followed fairly closely the amounts of bleach required, and hence decreased as the yields decreased.

Significance of Properties.

There are at present no accepted standards of quality or market grades of soda pulps. What may be sufficiently good quality for one purpose or one mill may be poor or medium quality for another. Aside from bulkiness and opacity, which depend mainly on condi-

tions not studied in these experiments, the desirable properties of a pulp are, in general as follows:

- (1) Low percentage of bleach required.
- (2) Low loss of bleaching.
- (3) High strength.
- (4) Durability (resistance to wear and decomposition).
- (5) Low ash content.
- (6) Few shives.
- (7) Absence of dirt.
- (8) Light color for the unbleached pulp.
- (9) Whiteness of the bleached pulp with freedom from certain undesirable tints.

It is not often that any one pulp has the advantage over another in all these properties, and for many uses some of them are of no importance. For aspen (popular) or other short fibred pulps used in the manufacture of book papers the properties which are given most consideration are freedom from dirt and shives and low percentage of bleach required, with the attendant low loss on bleaching. Both undercooked and overcooked pulps are to be avoided.

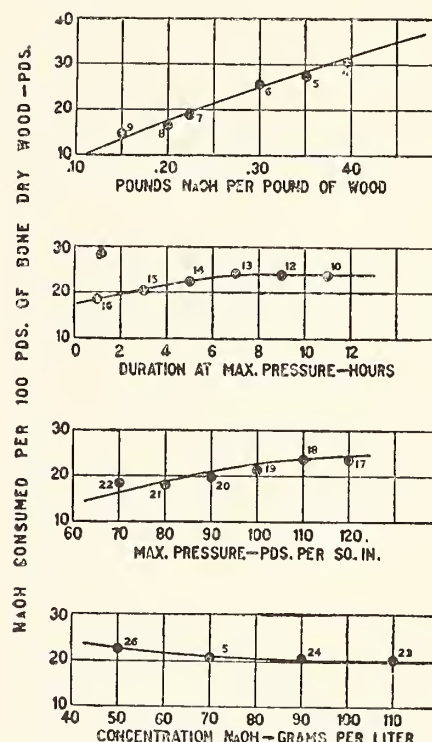


Fig. 13.—Effects of cooking conditions on the amount of caustic soda consumed.

Consumption of Caustic Soda.

By consumption of caustic soda is meant the neutralization of the free or active caustic soda (NaOH) existing as such in the digesting liquors. The neutralization results from the combination of the sodium (Na) of the alkali with the acid products derived from the hydrolysis of the lignified fibres during the cooking.²² The black liquors at the end of the cooking treatment contain in dissolved form these non-alkaline, sodium compounds, together with the remaining free caustic soda.

The effects of varying the cooking conditions on the consumption of caustic soda, expressed in per cent of the amount charged or the efficiency in its use, are shown in Fig. 12. The actual consumption in pounds per 100 pounds of wood is shown in Fig. 13.

As would naturally be expected, the greatest comparative efficiency for the cooks made with varying quantities of caustic soda resulted from the use of the smaller amounts. However, when very small amounts were employed, the cooking reactions were not sufficiently complete,²⁶ as indicated by the curves for yields and properties of the pulps. In this group of tests well-cooked pulps were first obtained with about 0.2 pound of NaOH per pound of wood. The efficiency in the use of the caustic at this point was about 85 per cent.

With increasing durations of cooking the efficiency in the use of caustic soda steadily increased until it reached a constant maximum value.

An efficiency of 95 per cent was obtained by seven hours' cooking at maximum pressure and since no greater efficiency was secured by continuing the cooking four additional hours, it is apparent that this represents the maximum efficiency attainable. That the cooking reactions are not due entirely to the presence of active caustic soda is indicated by the fact that after 95 per cent efficiency had been attained increased durations resulted in some further cooking effect²⁷ (see curves for yields and properties of pulps) with no increase in the amount of chemical consumed. Increasing the pressure also resulted in greater efficiency in the use of caustic soda until a maximum of 95 per cent was obtained.

In all groups of tests in which a constant amount of caustic soda was charged into the digester for each cook, greater percentage efficiency in its use could mean only a greater actual consumption of the chemical. In the group of tests varying the amounts of caustic soda, the decrease in percentage efficiency was accompanied also by increase in the actual consumption. It is thus apparent that the more thorough cooking, whether produced by increasing the amount of chemical in the charge or the duration or the pressure of cooking, is in large part at least, due to the greater completeness of the reaction between the chemical and the wood.

The tests employing various initial concentrations of caustic soda in the digester liquors (the amount of caustic soda charged always remaining the same) seemingly do not bear out this conclusion.

In most respects the determinations of yields and properties of the pulps in these tests indicated that the more concentrated solutions resulted in more thorough cooking, but no increase in the consumption of chemical occurred; in fact, with increase of concentration, a decrease of consumption and subsequently decrease of percentage efficiency are indicated. While the possibility of error is not eliminated,²⁸ this result indicates the need for further investigation.

Relation between Caustic Soda Consumed and Yields

For the purpose of further studying the cooking effects of the various conditions employed, yields of total crude pulps from all of the cooks were plotted against amounts of caustic soda consumed per 100 pounds of wood charged (Fig. 14). The average curve drawn through these points indicates a definite relation between yields and amounts of caustic soda consumed, regardless of the cooking conditions. However, even if it is assumed that the location of some of the points is due to experimental errors, the relation, as regards individual cooks, can be only an approximate one, since it has already been pointed out that in some of the tests increased cooking effects were obtained without any increase in the consumption of caustic

soda. If the curve were produced for lower amounts of caustic soda, the yields would probably be somewhere between 80 and 100 per cent at zero consumption, since under these conditions cooking could still be effected by water alone²⁹

Since the completion of these experiments Mr. E. Sutermeister has published³⁰ the result of some tests in which a small rotary autoclave and copper flasks were used as cooking vessels. Yields varying from 93 to 24 per cent and consumptions of caustic soda varying from 0 to 29 pounds per 100 pounds of wood were

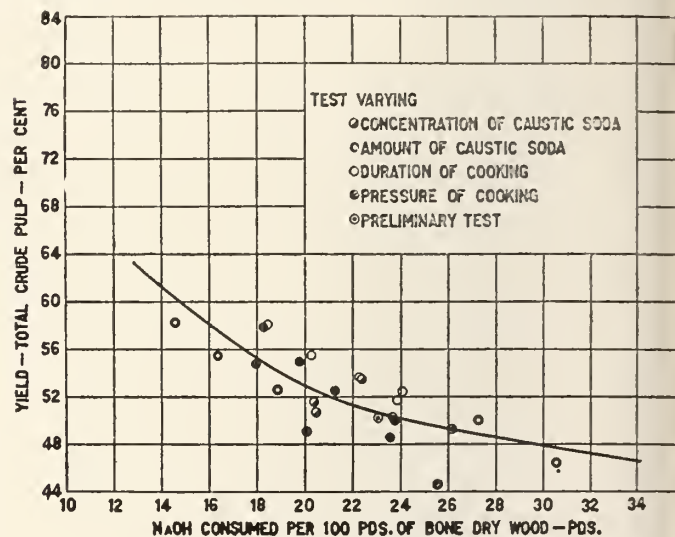


Fig. 14.—Relation between yields and amount of caustic soda consumed.

obtained,³¹ giving a relation similar to that indicated by the curve in Fig. 14. However, in his experiments a greater reduction of yields was obtained per unit decrease in the caustic soda consumed, which is probably due to differences in test material, method of experimentation and apparatus employed.

The actual consumption of caustic soda during cooking is a factor which is not given sufficient consideration in commercial practice, although it is one of considerable importance for an intelligent control of the cooking operations. By a careful study of the consumption, together with the other effects of the various cooking conditions. That pulp mills do not ordinarily determine the consumption of caustic soda and the efficiency of its use is due to the length of time necessary for the analysis of the black liquors. While the method used in these experiments requires some time for carrying out the analysis, its occasional use in commercial operations would be of benefit in determining the conditions to be used in future cooks.³² If there were a rapid and accurate method of analysis such as is used in sulphite mill operations, it would assist in determining when the cooking had progressed far enough, at which time the digester could be blown. Production of undercooked or overcooked pulps would thus be avoided.

Severity of Cooking as Indicated by Microscopic Appearance of Fibers.

A good indication of the thoroughness or severity of cooking may be obtained by microscopic examinations of the pulp fibres³³. The effects of varying the cooking conditions are shown in figure 15; curve A represents the relative abundance of vessels in the pulps; curve B, the ray cells; curve C, the fibre bundles or shives; curve D, the prominence of the ves-

sel markings; and curve E, the apparent strength of fiber walls. Since there are no absolute units for measuring these effects, the ordinates as shown for each curve represent arbitrary units ranging from 0 to 10. The photomicrographs in Plates II to VII, inclusive, present some of the more pronounced effects³⁴ while various gradations resulted,³⁵ the experimental pulps may be classified in the following three groups:

Overcooked pulps.—Severe digestion treatments resulted in "over-cooked" pulps, examples of which are seen in Plates II and III. The walls of the fibers show a considerable degree of weakness, as indicated by their thin transparent appearance and by their much twisted and fractured condition. The relative number of vessels present in the pulp is low as compared

able even when the microscopic slides are examined with the naked eye. Undercooked fibers develop a deep color from the particular stain used in mounting, and on this account appear very distinct.

Of the several groups of tests, the one varying the amounts of caustic soda per pound of wood resulted in the greatest range of severity of cooking as determined by the microscopic appearance of the pulp fibers. A small amount of chemical resulted in an undercooked pulp. With increases in the amount the strength of cell walls gradually decreased, the wood vessels suffered gradual destruction, and their markings were dimmed. The ray cells and fiber bundles disappeared soon after the point was reached where the maximum yield was attained. The higher amounts of caustic gave the overcooked effects.

For varying durations of cooking the effect was practically the same, and undercooked pulps were obtained at the shortest duration used. However, the highest durations employed did not give as severely

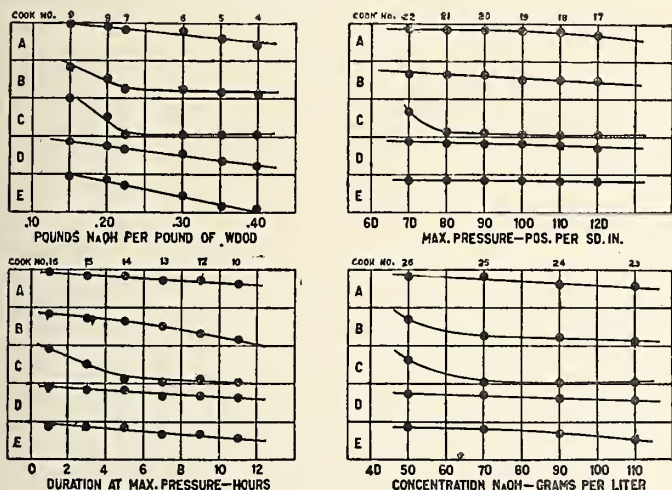


Fig. 15.—Effects of cooking conditions on pulp fibers. A, abundance of wood vessels; B, ray cells; C, fiber bundles, or shives; D, prominence of vessel markings; and E, apparent strength of fiber walls.

with the normal number present in the wood, and the pits and other markings on them are only dimly visible. Many of the vessels remaining are ragged and partly disintegrated; and the pulp, for the most part is also characterized by an absence of the comparatively thin-walled, delicate ray cells. Fiber bundles also are absent, since these are made up of fibers bound together by groups of the brick-shaped ray or parenchyma cell. The indistinctness of the vessels and fibers is due chiefly to the removal of the ligneous infiltrations of the cell walls, in consequence of which the elements developed very little color from the particular stain used in making the microscopic mounts.

Well-cooked pulps.—Pulps produced under less severe conditions are made up of stronger fibers, such as shown in Plates IV and V. The middle treatments are apparent in the increasing number of ray cells and vessels, the latter being well preserved and showing their markings quite clearly. The fibers are twisted or broken to only a small extent, and yet are so well separated that there are no fiber bundles.

Undercooked pulps.—Plates VI and VII illustrate the characteristics of undercooked pulps, and show plainly the mildness of the digestion treatments employed in their production. Well-preserved vessels with sharply defined markings are clearly visible, ray cells are numerous, and the walls of the fibers are less dissolved away than in the more thoroughly cooked pulps. Coincident with these characteristics, there are also present many fiber bundles or shives, notice-

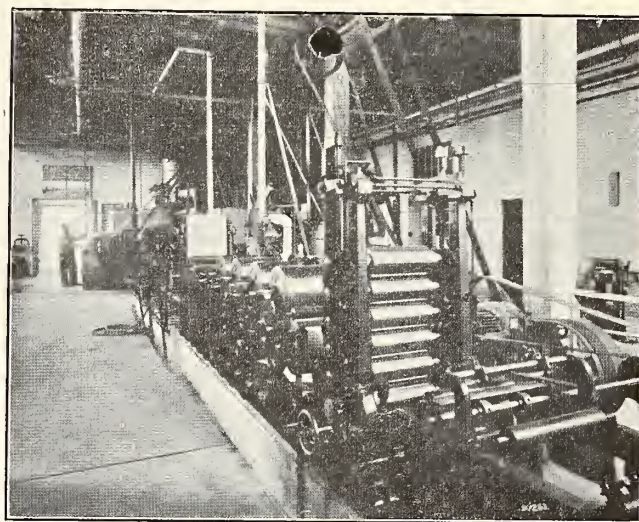


Plate 1.—Paper Machine, Forest Products Laboratory, Madison, Wis.

cooked pulps as were obtained with large amounts of chemical. While all of the tests varying the cooking pressures resulted in fairly well cooked pulps, there was a tendency toward undercooking at the lowest pressure used. The tests varying the initial concentrations also resulted in well-cooked pulps, except for the highest concentration, where a slight overcooking effect was observed.

Influence of Cooking Conditions on Cost.

While it is not feasible from the data at hand to discuss all cost factors affecting the commercial production of pulps, the more direct effects of the cooking conditions employed can be shown. The actual effects on the cost of production, of course, depend upon various other operating conditions at any particular mill, but the general trend of the effects is the same, irrespective of local conditions.

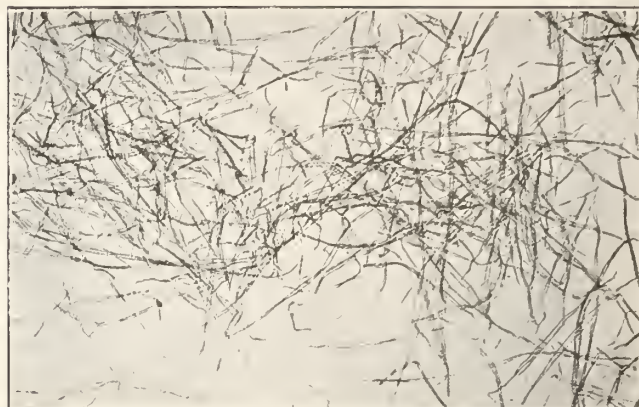
Time.

Shorter durations of cooking result in more efficient use of the digesting apparatus; more cooks can be made per day or per week, and, as has been shown, yields of pulp per unit of wood are also increased, and consequently more pulp is secured per cook. The

**PLATE II.**

Fibers of an Over-Cooked Pulp Produced with a Large Amount of Caustic Soda. (Cook 4.)

Partial disintegration has taken place. The fibers are fragmentary and contorted with rather weak cell walls. The vessels with barely visible markings are on the point of being eliminated.

**PLATE V.**

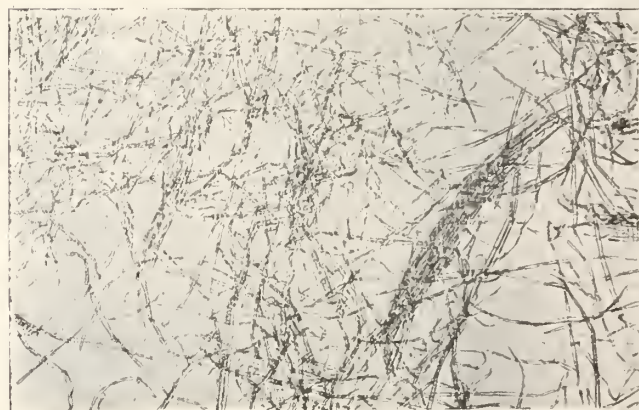
Fibers of a Well-Cooked Pulp Produced with a High Pressure of Cooking. (Cook 17.)

This is a strong, well-separated pulp.

**PLATE III.**

Fibers of an Over-Cooked Pulp Produced with a High Concentration of Caustic Soda. (Cook 23.)

The fibers are somewhat fragmentary.

**PLATE VI.**

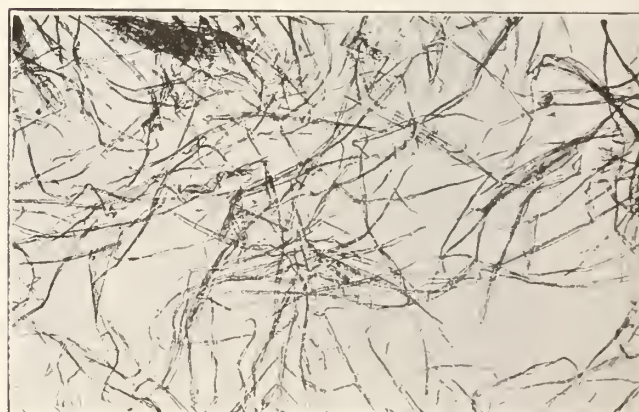
Fibers of an Under-Cooked Pulp Produced with a Short Duration of Cooking. (Cook 16.)

Many shives, consisting of two or more unseparated fibers which parallel each other, are present.

**PLATE IV.**

Fibers of a Well-Cooked Pulp Produced with a Medium Amount of Caustic Soda. (Cook 7.)

This is a pulp of average good quality. Vessels are well defined.

**PLATE VII.**

Fibers of an Under-Cooked Pulp Produced with a Small Amount of Caustic Soda. (Cook 9.)

Note the vessels with well-defined markings and the ray cells holding together a group of fibers constituting a shive.

greater plant capacity thus obtained would result in a proportionate decrease of operating costs per ton of pulp.

Figure 16 shows the production of pulp per 24 hours continuous operation for each 100 pounds of wood capacity of digester as influenced by various durations of cooking. The curve was derived from the experimental data, assuming a one-hour period for blowing the digester after completing a cook and for charging the next cook, and a similar period for attaining maximum cooking pressure. Thus, for a three-hour period at maximum pressure, the total time between the charging of two consecutive cooks is five hours. Computation shows that decreasing the duration at maximum pressure from eight to five hours increases the daily output 48 per cent, while a decrease from ten to three hours increases the output 156 per cent. If the time allowed for blowing and charging the digesters and for raising the digester pressure is decreased, the increase in the daily output will be even more pronounced as the duration of cooking is shortened.

Steam Consumption.

While the consumption of steam varies with the duration of cooking, it is influenced also by the pressure maintained in the digester and more by the relative

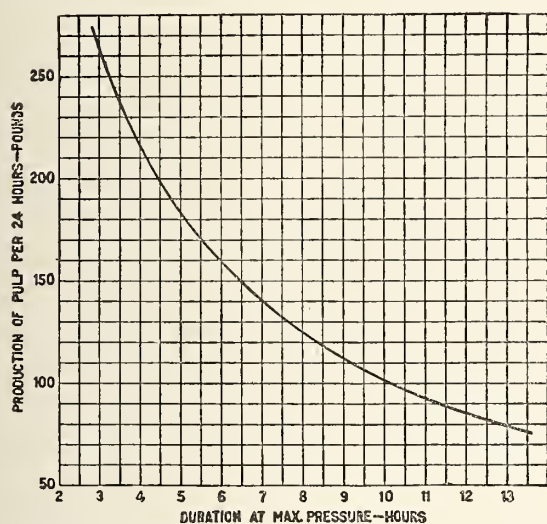


Fig. 16.—Effect of duration of cooking on production in 24 hours.

volumes of the liquor charge. Under the testing conditions employed, the volume of liquor varied both with the amount of caustic soda charged (the concentration being constant) and with the concentration (the amount of chemical being constant). Since the heating was accomplished by steam blown directly into the digester, a measure of the amount of steam used is afforded by the increase in the volume of liquor during cooking.³⁶ The effects of the cooking conditions on the resultant condensations are shown in figure 17. Curves showing the initial volumes of digester liquors for two of the groups of tests are also included in the same figure.

In the tests employing various proportions of caustic soda, the amount of liquor at the start of cook varied directly with the amount of chemical, as shown by the straight-line curve. The condensation also increased rapidly as the amounts were increased. The downward turn in the heavy-line curve for the higher proportions of caustic is caused by the digester becoming filled and overflowing through the top relief

during the final stages of cooking. However, the dotted line shows the corrected curve, taking the overflow into consideration. The rapid increase in the condensation is a natural consequence of increasing the amount of cooking liquor, which has a high specific heat.

In the tests employing various cooking periods the main influence on steam consumption was the heat lost by radiation, since the initial volumes of digester liquors were constant. The curve in figure 17 representing this effect has been drawn as a straight line to show only the general trend. It will be observed, however, that the platted points occur in two distinct groups. That the reaction between wood and caustic soda is of an exothermic or heat-generating nature may partly explain this arrangement. In the one group, representing the cooks of longer duration, the cooking reaction was practically completed before the end of the cooking period (see analogous curves in Figs. 12 and 13). This would result in relatively higher amounts of condensation, since no heat of reaction would be generated during the later stages of cooking.³⁷ The same explanation could apply to the cooks made at the higher pressures.

The influence of higher cooking pressures on steam consumption results from the greater amount of steam required to heat the digester and its contents to the

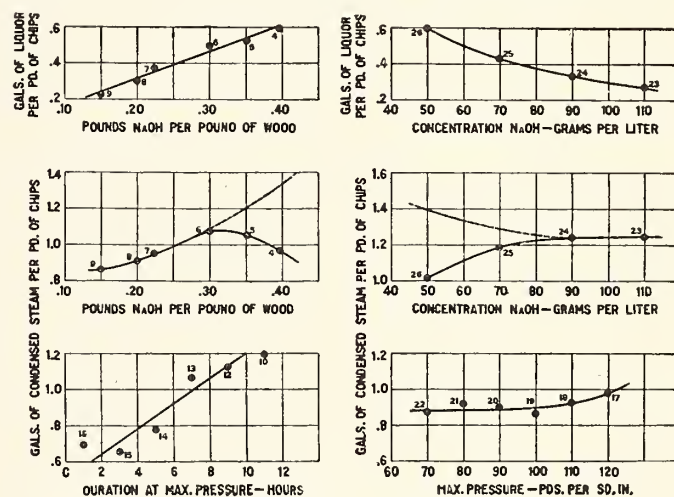


Fig. 17.—Effects of cooking conditions on initial volume of digester liquors and on condensation of steam.

higher temperatures. The initial volumes of cooking liquor did not vary. The condensation curve indicates that this effect was comparatively small in the tests.

Like the tests varying the amount of caustic soda, those varying the initial concentration influence the steam consumption principally by the amount of liquor in the charge, which varies as shown by the true hyperbolic curve in figure 17. Hence, increasing the initial concentration decreased the condensation, as shown by the corrected curve in figure 17, which takes into account the overflow of the digester in cooks 25 and 26.

In considering these results from a commercial standpoint it should be kept in mind that the experimental apparatus was comparatively small. On this account the heat or steam required for raising the temperature of the digester and for replacing heat lost by radiation per unit of digester capacity was far greater than would be experienced in mill operation. Hence, much less steam per pound of chips would be required in commercial operations than is shown by

these curves. The effects of increased duration of cooking and increased pressures especially would be much less pronounced, since with these radiation is the more important factor.

Aside from the direct cost of steam, the condensation is of importance in another way. The tests have shown that decreased initial concentrations, other cooking conditions being constant, result in less severe cooking. It is to be expected that the decrease of concentration throughout the cooking period, due to condensation, also tends to minimize the cooking effects in a similar manner.²⁸

The use of superheated steam in cooking, the installation of larger digesters, the insulation or lagging of digesters, and the use of the minimum volume of cooking liquors at the start of cook are means frequently employed by pulp mills to reduce the condensation.

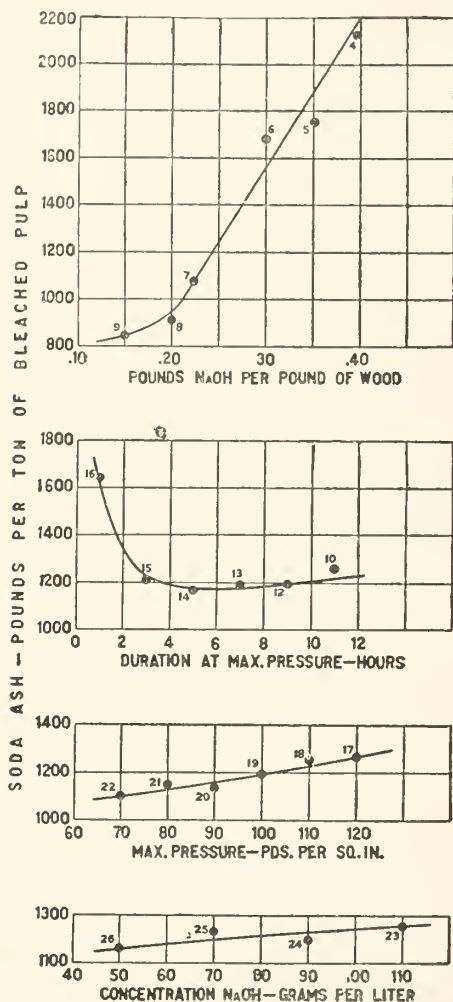


Fig. 18.—Effects of cooking conditions on amount soda ash employed per ton of pulp.

Chemicals Per Ton of Pulp.

The chemicals directly employed in the manufacture of soda pulp affect cost of production, in that the full amount of alkali charged to the digester can not be recovered, while the bleaching powder after being used is of no further value. The curves in figures 18 and 19, expressing the effects of the cooking conditions on the amounts of chemicals employed per ton of air-dry, bleached pulp, were derived from the experimental data as explained on page 48, appendix. The amounts shown are less than those generally employed in commercial practice, for several reasons:

(1) The yields of pulp are higher; (2) the losses on bleaching are less; (3) the amounts of chemical charged per pound of wood are less; and (4) the amounts of bleach required are less. Whether or not pulp mills can duplicate or approach these results, the general trend of the curves would not be affected.

Soda Ash.

The amounts of caustic soda and sodium carbonate charged to the digester in the several groups of tests have been calculated to show the equivalent amounts of commercial soda ash (58 per cent Na_2O) per ton of bleached pulp produced. (Fig. 18.) Increasing the amounts of caustic soda charged per pound of wood obviously results in increasing amounts of soda ash per ton of pulp, and the decreased yields of pulp resulting from the more thorough cooking make the effect more pronounced. A bend is found in the curve at the point of maximum yield, since for am-

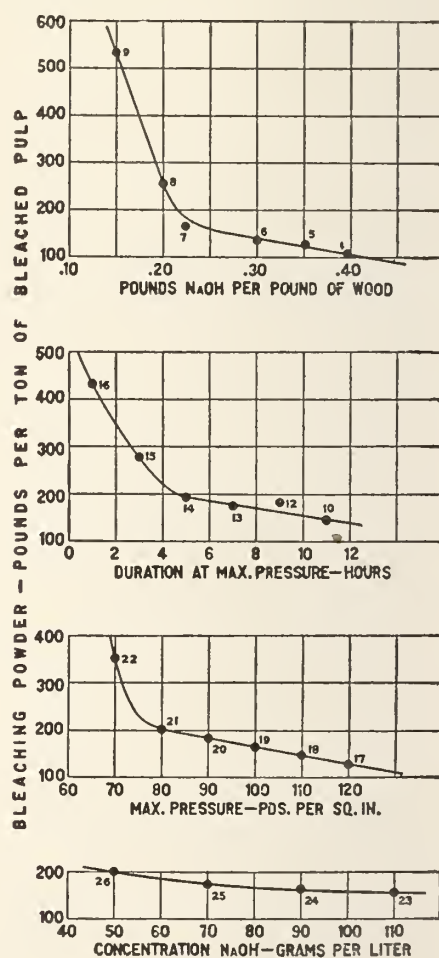


Fig. 19.—Effects of cooking conditions on amount of bleaching powder employed per ton of pulp.

ounts of caustic below this point the yields decrease rapidly and their influence on the amount of soda ash employed per ton of pulp becomes more apparent.

When varying the durations and the pressures of cooking and the initial concentrations, the amounts of soda ash per ton of pulp were affected by yields alone, and the minimum amount is employed under conditions which give the maximum yields. Increased durations, pressures, and concentrations afford decreased yields, and the amount of soda ash per ton of pulp consequently is increased. The plotted point for cook 10 is not on the curve, due to the initial diges-

ter liquors for this cook having had about 3 per cent lower causticity than the other cooks in this group of tests. Lower causticities involve the use of a greater amount of soda ash for the same amount of caustic soda.

Bleaching Powder.

The curves in figure 19 show that increasing the amounts and concentrations of caustic soda and the durations and pressures of cooking result in all cases in decreasing the amounts of bleaching powder consumed.

Yields do not influence the calculations, since the consumption per ton of bleached pulp depends on the per cent of bleach required and the bleaching losses. The ordinates for the curves represent bleaching powder of 35 per cent available chlorine, and losses in making the bleaching solutions are disregarded.

Combined Cost of Wood and Chemicals Per Ton of Pulp.

The curves in figure 20 show costs for certain items in producing a ton of bleached pulp (2,000 pounds air-dry basis) as influenced by variations in the cooking conditions. Curves marked A represent cost of wood alone; curves B, cost of wood and soda ash; and curves C, cost of wood, soda ash, and bleaching powder. The vertical distances between curves A and B represent cost of soda ash alone, and those between curves B and C represent cost of bleaching powder alone.

The cost values were obtained by calculations from the amounts of wood, soda ash, and bleaching powder consumed, based on the experimental results.³⁹ A 90 per cent recovery of the cooking chemicals charged to the digester was assumed in determining the amounts of soda ash consumed or lost per ton of pulp. The basic units for costs are assumed average values as follows:

Wood, \$9 per solid cord (100 cu. ft.); soda ash (58 per cent Na_2O), \$1 per 100 pounds; bleaching powder (35 per cent available chlorine), \$1.55 per 100 pounds.⁴⁰ The bone-dry weight of aspen wood is taken as 26.68 pounds per cubic foot of clear wood, green volume.

With increasing amounts of caustic soda in the digester charges the cost due to all three factors is decreased until the point of maximum yield of good pulp is attained, after which the total costs increase, due to the increasing amounts of wood and of soda ash consumed. The decreasing cost of bleaching powder only partially offsets the increase due to the other two factors.

With increasing durations the effect is practically the same, so far as wood alone is concerned, except that the increase in its cost for higher durations is not so pronounced as with increasing the amounts of caustic soda. The soda-ash costs alone are practically constant, and hence increase the wood costs by a constant amount. However, as the durations increase the bleaching-powder costs decreased sufficiently to overcome the effect of increasing wood costs. After the minimum duration for successful cooking (as determined by yields) has been exceeded, the decrease in total cost is very small, and would not be sufficient to offset increased costs incident to the time element discussed previously.

For variations in the pressures of cooking, the influence of bleaching-powder costs is especially marked. The minimum costs due to wood and soda ash result

from the use of the lower pressures. When bleaching is considered, the minimum cost is obtained by using medium pressures, although the increases for the higher pressures are very small.

Combined costs for the three factors are practically unaffected by variations in the initial concentrations, but if bleaching is omitted the costs of wood and soda ash are larger with the higher concentrations.

All of the diagrams show that of the three cost factors considered, wood is of the most importance and that bleaching powder is more influential than soda ash in determining total costs. Increases in costs of wood and soda ash with increasing severity of cooking are, in all cases, offset to a greater or less extent, by decreases in bleaching-powder costs. If maximum or minimum values⁴¹ had been used for either wood, soda ash, or bleaching powder, instead of the average value, or if a different percentage recovery for the soda ash had been assumed, the general effects would not be changed, although they might become more or less pronounced.

Summary.

(1) The amount of caustic soda per pound of wood, the duration of cooking, the pressure or temperature of cooking, and the concentration of the cooking chem-

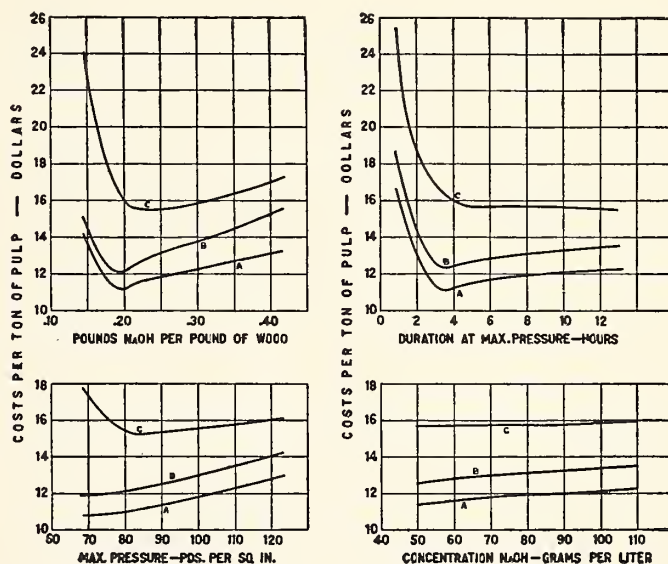


Fig. 20.—Effects of cooking conditions on cost items per ton of pulp. A, wood; B, wood and soda ash; and C, wood, soda ash, and bleaching powder.

icals employed in the production of soda pulp influence the yield and properties of the pulp by influencing the severity of the cooking reactions.

(2) Severity of cooking is an effect mainly of the amount of caustic soda consumed per unit of wood. Increasing the amount or concentration of the chemical or the pressure of cooking produces a quicker reaction and hence one more complete in a given length of time. Increasing the duration results in a more complete reaction because of the longer time allowed for the available caustic soda to be consumed.

(3) Greater severity of cooking is accompanied by a decrease in the yield of crude pulp, and usually of screened pulp. If screenings are present in considerable quantity (due to incomplete cooking), more thorough cooking increases the yield of screened pulp.

(4) The properties of the pulp are influenced by greater severity of cooking as follows:

- (a) Shives are decreased in number or eliminated.
- (b) Bleaching is rendered more easy and the loss on bleaching becomes less.
- (c) The strength may either decrease or increase, depending upon which cooking conditions is varied and the degree of variation.
- (d) The color of the unbleached pulp becomes lighter within certain limits, beyond which it may, under certain conditions, become darker.

(5) A good indication of the severity of cooking is the appearance of the individual fibers when examined under the microscope.

(6) The decreased yields resulting from more severe cooking result in a greater cost of wood and soda ash per ton of pulp. As a rule, the smaller cost of bleaching powder incident to the more easily bleached pulp produced by thorough cooking only partially offsets the greater cost of wood and soda ash.

(7) While the amount of bleach required decreases with increasing severity of cooking, a point is soon reached where the decrease in bleach required is not commensurate with the decrease in yields.

(8) Increasing the initial amount of digester liquor increases the condensation and steam consumption (and hence the cost) because of the greater volume to be heated; increasing either the duration or pressure has a similar effect because of the greater losses of heat by radiation.

(9) Yields (bone-dry basis) of well-separated unbleached pulps as high as 56 or 58 pounds per 100 pounds of wood can be obtained from aspen if the wood is of the best quality. Yields of from 54 to 55 per cent were obtained which required only from 10 to 11 per cent of bleach. The variation in yields obtained by changing the cooking conditions was from 46 to 58 pounds per 100 pounds of wood charged, or about 26 per cent based on the lowest yield.

(10) Minimum total durations of from 3 to 4 hours may be successfully applied to the cooking of aspen for bleaching pulps, provided the other cooking conditions are properly maintained.

(11) Aspen may be successfully cooked with a minimum of from 20 to 25 pounds of caustic soda charged per 100 pounds of wood. The amount of this chemical actually consumed in the production of well-cooked bleaching pulps varies from 18 to 24 pounds per 100 pounds of wood.

Practical Value of Results.

The experiments discussed in this bulletin have shown in detail the effects of certain cooking conditions on the yields and properties of the resultant pulp, on the efficiency of the cooking chemicals, and on various items affecting costs of production. From a study of these results it should be possible for a mill operator so to regulate the cooking process as to secure the largest possible yield of pulp of the desired quality at a minimum cost for chemicals, fuel, labor, and overhead charges in so far as the operation is affected by the cooking conditions considered.

The clear, sound wood used in the experiments afforded yields of good pulp from 10 to 25 per cent higher than the better run of the yields reported by pulp mills. Moreover, some of these experimental yields were obtained with shorter cooking periods and

less chemicals than are employed commercially. Although the laboratory results may not be equalled in mill practice, the possibility of greatly increased efficiency in the process of converting wood into soda pulp is indicated.

The Appendix to Dr. Surface's bulletin is not reproduced in these columns. This portion of the treatise deals with the qualities of aspen as a raw material for paper pulp, and the nature of the pulp produced. There are also records of the series tests, with tables, description of methods for auxiliary tests for properties of unbleached pulp, and analyses of soda liquors.

The results of autoclave tests made in 1909 by Mr. Sutermeister form an interesting study and a bibliography, giving references on the properties of aspen and its use as a pulp wood, the soda process, and the effects of caustic soda and water and cellulose brings to a close a most enlightening treatise.

Reference Notes.

¹⁷Manufacturers' analysis.

¹⁸The numerals opposite each platted point on the curves are the serial numbers of the cooks. (See Tables 10 to 14.)

¹⁹See Tauss's experiments, Table 1.

²⁰Tauss used for a single boiling as high as 7 pounds of caustic soda per pound of wood, and the yield of undissolved material after three hours at 58.8 pounds per square inch steam pressure amounted to 8.52 per cent for beech and 2.87 per cent for pine. With 4 pounds caustic soda per pound of wood in each of three successive three-hour treatments under a steam pressure of 132.3 pounds per square inch, the yields for the two woods were 20.61 per cent, and 18.20 per cent, respectively. This latter proportion of caustic soda was ten or more times as great as is ordinarily employed in commercial practice. Also the other cooking conditions were proportionately more severe.

²¹Figures 12 and 13 show that the active cooking chemical was consumed at the end of 7 hours at maximum pressure; it is therefore not apparent from these tests what would be the effect of continued cooking in the presence of available caustic soda.

²²As the initial concentrations increased, the volume of digester liquors at the start of cook decreased (see Fig. 17), since the amount of caustic soda was held constant. Hence, increasing concentrations would eventually result in a volume of digester liquor so small that the whole charge of chips would not be covered until late in the cooking period after the liquor had been sufficiently diluted by the condensed steam used in cooking. In this case part of the chips would receive very severe treatment, while the remainder would more or less escape the cooking effect. The resulting pulp would represent a composite of the two conditions.

²³Special precautions were taken to eliminate the influence of dirt. Further it does not seem reasonable that the cooking action which removed the lignin and other organic matters should have produced in the fibrous residue or pulp a concentration of the mineral constituents which go to form the wood ash.

²⁴The data are not sufficient for expressing the effect in detail. The true curve would be expected to have a bend coinciding with the point of maximum yield of screened pulp or the point where the shives are reduced to zero.

²⁵See De Cew's discussion, p. 6.

²⁶It is a well-known chemical law that in order to carry a reaction to a given degree of completion for one of the reacting substances it is necessary to have available a certain excess of the other chemical or chemicals which take part in the reaction. This means that the efficiency in the use of the chemical can not be 100 per cent. The speed of the reaction is proportional to the amount of the excess.

²⁷For the effect of water alone, see Tauss's experiments, Table 1.

²⁸The test data show a loss of digester liquor overflowing through the "top relief" for cooks 25 and 26 (that for cook 26 showing the greatest loss), and it is due to the platted

points for these two cooks that the curves indicate greater consumption of caustic soda at the lower concentrations.

²⁹See Tauss's experiments, Table 1.

³⁰Paper, p. 15, No. 2, vol. 9, Sept. 25, 1912.

³¹In obtaining yields higher than 75 per cent, the test material was treated at atmospheric pressure. Under this condition the cooking effect of water alone would have but little influence unless long duration of treatment were used.

³²The boiling of rags with caustic soda solutions for the production of rag pulps is controlled in this manner.

³³For the normal appearance of fibers in the uncooked wood see Plates VIII and IX, as well as the discussion on p. 42.

Plates 8 and 9 not reproduced.—Ed. Pulp and Paper Magazine.

³⁴The remarks following the title of each plate and the discussion in the text are not based on the fields shown in the photomicrographs alone.

³⁵The photomicrographs, in the order of their sequence, show gradations of severity of cooking.

³⁶The steam used was not perfectly dry, containing a small amount of moisture or "priming." However, as the steam was of approximately the same moisture content for all tests, the "condensation" was proportional to the amount of steam used.

³⁷The condensation curve (liquor in digester—gallons) in fig. 3, which is typical for most of the individual cooks in these experiments, also show a greater rate of condensation at the end of the cook than at earlier periods except during the first hour when the pressure was being increased. This can be accounted for only by the fact that heat other than from the steam alone, was supplied to the digester during the earlier stages of cooking. As the cooking reaction is most vigorous at the beginning, it seems probable that the heat supplied was heat of reaction.

³⁸It is evident that the effects obtained in the tests varying the initial concentrations are much less pronounced than would have been the case if the diluting effect of condensation had been absent. The autoclave tests, for which data are given in Table 15, afford fairly conclusive proof of this.

³⁹These amounts were calculated by interpolating from the yield curves (fig. 4) the loss on bleaching curves (fig. 10), and the curves for soda ash and bleaching powder employed per ton of pulp (figs. 18 and 19), and not from actual test data. On this account platted points have been omitted.

⁴⁰Reasonable maximum, average, and minimum values for a "solid cord" of aspen f.o.b. mill are \$11, \$9, and \$6, as determined from statistical reports received from a number of mills. Correspondence with pulp manufacturers brought the information that reasonable maximum, average, and minimum unit costs as defined above may be assumed with a fair degree of accuracy as follows: For soda ash, \$1.20, \$1, and \$0.85; for bleaching powder, \$2.05, \$1.55, and \$1.10. These values do not depend upon market fluctuations alone, but vary through the range given, due largely to differences in freight charges for mills in different localities. The actual selling price of "58 per cent" soda ash is 10-48 greater than the manufacturer's or market quotations, since the latter are based on the old standard of "48 per cent" soda ash.

⁴¹See footnote, p. 37.

⁴²The more general statements in the summary will be found to coincide in a greater or less degree with previously existing opinions, a fact not surprising when it is remembered that the soda process has been carried on for half a century. On the other hand, satisfactory evidence and data substantiating these opinions have not been available. The present investigation affords such information, as well as a basis for more specific conclusions.

WILL MAKE BOXES AT VANCOUVER.

A new industry that will, when running to full capacity, employ 200 hands, will shortly be established within the confines of Greater Vancouver, according to Mr. J. R. Davison, industrial commissioner for Vancouver. Mr. Davison stated that an United States firm composed of Boston capitalists, manufacturing a patented wooden box, would, in February or March, locate on a site to be selected bordering on the Fraser River.

The company is capitalized at \$250,000, fully paid up, and will make from British Columbia timber a new style packing box, three-ply veneer, with varying thickness, air-tight and impervious to moisture, and will do a trade with Ceylon, India, Europe and the United States. British Columbia produces the particular quality of timber required for the cases.

Notes on Causticising

SINDALL and BACON

(1)—Recovered Ash and Lime.

The conditions which make for the efficient and economical handling of the processes by which paper making fibres are converted into pulp are now so well understood that it is difficult to suggest methods for improving them. Nevertheless a survey of the operations involved and a consideration of their mutual dependence will be of value to students and others who are not familiar with the detail, and who may be personally concerned in the necessity of getting the best results. This would apply particularly to those to whom has been given the charge of the plant, and who desire to know something of the theoretical principles underlying the technical practice demanded by any specific process. It is true that a high efficiency obtains in most mills using the soda treatment for esparto and similar fibrous materials, and mainly through the skilled work of the chemist in charge, but the ordinary text books do not give the average student just the information he needs when seeking to instruct himself as to the reasons why a certain method adopted in practice always gives a good result, or on the contrary a poor result.

The process of causticising recovered ash and soda is perhaps one of the most interesting as well as one of the most important in the manufacture of paper pulp, and forcibly illustrates the value of a knowledge of first principles.

The chemicals used are, recovered ash obtained from the residual liquors of boilings of raw material, alkali of carbonate of soda required to make up losses in the recovery of soda, and caustic lime.

The first is a crude form of carbonate of soda derived from the combustion of the black soda liquors rich in carbonaceous matter dissolved from the original fibre. It varies considerably in composition containing active soda Na_2O from 38 per cent to 50 per cent according to the care exercised in the recovery process.

The second material is the comparatively pure commercial carbonate of soda, the composition of which is practically constant. The content of soda is 58 per cent Na_2O equivalent to nearly 100 per cent carbonate of soda, and unless the alkali has become wet by undue exposure to water this percentage may be relied on.

Since the carbonate of soda has no resolving action on raw fibre it cannot be used in the form of carbonate and its conversion into caustic alkali is the first step towards the production of a paper pulp. Hence the use of the third chemical caustic lime. This material is not of constant composition, some limes containing a large proportion of stone, others being imperfectly burnt in preparation, and all forms being liable to deterioration by exposure, owing to the absorption of moisture and carbonic acid gas from the air. The proportion of active lime CaO is therefore not a constant amount.

Table 1—Equivalent Weights of Recovered Ash.

% Na_2O	Tons	cwts	qrs	lbs.
48	100	0	0	0
46	104	6	3	23
44	109	1	3	8
42	114	7	2	6
40	120	0	0	0
38	126	6	1	7
36	133	6	2	18

Table 2—Equivalent Weights of Caustic Lime.

% CaO	Tons	cwts	qrs	lbs.
100	100	0	0	0
98	102	0	1	18
96	104	3	1	2
94	106	7	2	17
92	108	13	3	19
90	111	2	0	26

The effect of varying constitution of these chemicals is shown in the following tables:

Thus to get constant results in the process of causticising it is essential to make allowances for any serious variation in the composition of the recovered ash. In practice the method of production of the ash keeps the variation from day to day within very small limits, as will be shown later.

From Table 2 it will be noticed that in order to get the same amount of caustic soda from a recovered ash showing varying percentages of soda, different actual weights of the ash must be taken. Thus it will be necessary to take 120 tons of 40 per cent ash in order to get the same amount of caustic as that obtained from 100 tons of 48 per cent ash.

Similarly in the quantities of caustic lime used, the same attention must be given to the actual percentage of CaO. Thus 104 1-4 tons of 96 per cent lime will produce the same result as 109 tons of 92 per cent lime, other things being equal.

The losses which naturally occur in the recovery of the soda are made up by the use of fresh alkali or carbonate of soda, which is used in the proportions required according to the amount of ash recovered. Under the best conditions it is possible to recover 85-90 per cent of the caustic soda originally used. The remaining 15 per cent is lost in various directions as will be seen later when we come to discuss the actual recovery process, and this quantity has to be replaced by fresh alkali.

It is cheaper to use the alkali and causticise it together with the recovered ash than to make up the loss by using caustic soda purchased as such, since the cost per unit of active soda Na_2O is higher for caustic soda than it is for alkali causticised at the mill.—Paper Makers' Monthly Journal.

OTTAWA RIVER ABNORMALLY LOW.

Ottawa, October 5. — Not only is the low water of the Ottawa River causing some 1,000 men to idle about the streets of Hull just now, but it is also causing considerable anxiety to the firm of J. R. Booth. The serious question which now faces that company is where is the pulp coming from which is expected to keep their paper mills running.

It is learned that within a couple of weeks a large supply of 375 tons, which was stored early in the spring, will be about exhausted. While the mills were running early in the season a large quantity of pulp was stored for future use in the yards. In consequence of the war there has been an unusually heavy demand for newspaper, and consequently the big pile has been used up.

Mr. Jackson Booth, explained yesterday that unless the water in the river rises so that the firm can operate the pulp mills, which have been closed for nearly two months, pulp would have to be bought. This is a departure from the general custom, but he went

on to say that the paper mill would be kept running so long as there is any water at all in the river available for power.

Yesterday the river showed signs of rising, but the rise was not great enough to be of any use.

Mr. Booth explained that the water now was 18 inches lower than it should be, according to the agreement which the firm had with the government.

Every effort has been made to conserve the water so that the various mills may be run alternately, as the firm is very anxious to have the mills in operation.

At the present time some 1,500 men are working around the yards and mills. There are now more men than there is work for, but the firm is not willing to lay off any more than is absolutely necessary.

An employee of the firm who has seen 25 years' service, said that he had never seen such an unfortunate year as the past one has been. He declared that the firm as well as the men had suffered much loss by the mills being idle.

NEW LIFTING MACHINERY.

Two booklets descriptive of new machinery made by the Herbert Morris Crane and Hoist Co., Limited, indicate excellent progress in catering to peculiar needs of users of their class of products. Bulletin B9 describes a new standard overhead crane. Instead of running in the top of the rail, as is usual in overhead travelling cranes, the type "S6" is designed to run on the lower flange of two parallel I beams. These may be existing roof beams, or special beams simply attached to the roof trusses. What will immediately strike every practical man is the reduction of first-cost made possible by the elimination of the usual brackets.

Another feature is that the stresses on the structure itself are very much simplified. Sometimes the wall of a building would carry the crane, crane runway and load vertically, but it is too weak to resist the overturning effect of an ordinary crane carried on wall brackets.

Still another great advantage possessed by the type "S6" Crane is to be found in its ability to connect up with a Morris Overhead Runway. The combination is a source of much time-economy, as it eliminates many useless re-handlings of the load.

Bulletin Y17 describes the Morris Folding Tubular Steel Tripod. One feature which will appeal to contractors, structural engineers, stone workers and other users of this kind of lifting gear is the ability to fold up the tripod without removing any bolts or pins.

A broad flange is provided on each foot to enable the tripod to carry a load on soft ground, and a square point gives a good "grip" on harder surfaces.

Another new feature is the provision of a small pulley at the top of the tripod by which a small rope can be used to haul up the heavy lifting block or to handle very light loads quickly.

Every tripod is tested with a 50 per cent overload, so that the safety of the user is always assured.

It is also worthy of note that even in the one-ton capacity the tripod is light enough for one man to carry on his shoulder. Those who have had experience of hauling around the home-made wooden shear-leg will be able to appreciate this feature to the full.

WHO'S WHO IN THE PULP AND PAPER INDUSTRY

MR. GEORGE E. CHALLES

"Do you know Challes?" "Well, I should say that I do. He is the fellow that has such a great admiration for Hawkesbury Pulp," remarked a widely known paper manufacturer across the border when asked this question a few weeks ago. And George E. Challes, who for many years has been selling easy bleaching sulphite for the Riordon Pulp and Paper Co. of Montreal, from New York City to the Mississippi River north of the Mason and Dixon line, is perhaps the most widely-known Canadian calling constantly upon the trade in Uncle Sam's domain. He has always believed in the superiority of his product, talked it in season and out and so convincingly that the firm to-day dispose of the major portion of fifty thousand tons annually in the great market to the south, although never neglecting the requirements of their Canadian customers.



"The man on the road," for the company, he travels over forty thousand miles a year on the average and never misses a trip. There are few more conversant with the market situation, the sources of supply, manufacturing facilities, foreign shipments and statistical data than he.

Any mill supply man plays a decidedly important and influential part in the great paper trade of the country. He is the barometer of conditions, the library of knowledge and the storehouse of facts—for the selling end of any organization is the vital

force which keeps the industry busy and the workmen employed. For thirty-four years the subject of this sketch has been actively connected with the pulp and paper trade. That has been his hobby and life work.

Napanee is the capital of the united counties of Lennox and Addington, and it was there that Mr. Challes was born in 1857. After completing his education at the public schools and the Napanee Academy, as the upper school was then known, he landed his first job in a local law office, where he performed clerical work for five years. Then one day a vacancy occurred on the staff of the old Napanee Mills Paper Manufacturing Co., at Napanee Mills, now known as Stratheona, located about five miles up the river. He secured the position, and thus entered upon his first introduction to the business, being placed in charge of the mill supplies and attending to the correspondence. William Hanson, now of Hanson Bros., a leading financial firm in Montreal, was the salesman of the Napanee Paper Co., in Toronto. In 1882 he was appointed representative of the Travellers' Insurance Co., of Hartford, Conn., for the province of Quebec and another man had to be selected in his place. Mr. Challes was sent to Toronto to undertake the task and given charge of the warehouse at 114 Bay Street. The Napanee Paper Mills had three machines in those days. The widest was seventy-two inches and travelled at about one hundred and fifty feet per minute, which, when contrasted with the big Fourdriniers of the present time with a width of two hundred inches and over and speeding along at the rate of six and seven hundred feet every sixty seconds, affords some conception of the rapid advance that has been made in the art of producing news print. The output of the Napanee mills was about eight tons per day of news and semi-book papers. The industry supplied the Mail, Globe, Telegram and the World with paper which then commanded about seven cents per pound, being made principally from soda pulp and rags, the Napanee concern maintaining a soda pulp plant at Fenelon Falls, Ont. Gradually ground wood pulp and sulphite came into use which lowered the figure for the product until in the early nineties news print could be bought for about three and half cents. The Napanee paper Co. slowly found itself outdistanced in competition in material and output, and got into financial difficulties. The mills were eventually sold and went into another line of product.

It was about this time that Mr. Challes met his old and life-long friend, John R. Barber, the dean of the paper trade in Canada, one afternoon on the street, who suggested that his services be tendered to the Georgetown mills and the Riordon Pulp and Paper Co. Feeling that there was a good future in this connection, it was not many weeks later, in 1893, that Mr. Challes went on the road to sell the output of news print of the Riordon plant at Merriton, which was then about twenty tons per day, and to devote a portion of his time to handling the book papers made by William Barber and Bros. at the historic Georgetown mill. The Riordon Co. were not manufacturing sulphite in any quantity and the big pro-

position at Hawkesbury was an after-development. For some years Mr. Challes sold jointly for the Barber and Riordon, and when the latter branched out heavily in the sulphite fibre line in the late nineties, he devoted all his energies to their work. In the evolution of affairs the Riordon Company have ceased making paper of any kind, and now turn out fifty thousand tons annually of chemical pulp, being the largest producers in the British Empire at their mills at Hawkesbury and Merriton.

The company have two sales managers, who have always worked together in harmony and unity—T. J. Stevenson directing the selling end from the head offices in Montreal, and Mr. Challes doing the travelling and keeping in close touch with the trade at all outside points. Spending fully three-quarters of his time on the road, the daily reports forwarded by him, are always complete and up-to-date.

A man of few hobbies, he knows the pulp situation thoroughly and intimately, and enjoys a continent-wide connection with the trade, having come in close contact with practically all the book, writing and bond paper manufacturers in America. A large portion of his time is spent in interviewing manufacturers across the line, and he never fails to uphold Canadian institutions, industries and policies. On any matters of international importance to the trade he expresses his views frankly and fully, and has thus gained the respect and esteem of all with whom he does business. A resident of Toronto for thirty-two years, he is one of the veteran representatives on Bay Street, where he has had a warehouse or office for this long period.

His views on the sulphite situation at the present time are interesting, due to conditions arising from the war. "Yes," he said, "owing to the shutting off of European supplies, which came to America at the rate of about eight hundred tons a day and the shipments on the docks, which have been cleaned up, there has been a natural stiffening of prices. Canada furnishes the United States about seventy thousand tons of sulphite each year and, after the outbreak of hostilities, there were numerous anxious inquiries from all over the land asking us to furnish enormous quantities at short notice, but our product is pretty well contracted for, and we protect all those whom have been our customers for years. It has always been the policy of the firm to safeguard the welfare of its patrons in every way, and no advantage is being taken of present state of affairs. Naturally there has been an advance of a few dollars, but contracts for a long term cannot be entered into. No one can guarantee prices for any extended period under present circumstances. What the future will bring forth no man can tell. It depends largely upon the length of the strife, water conditions and domestic quantities that can be obtained. I understand that Swedish mills have closed down partially, and that most of their product has been bought up. There may be a shortage in January or February next, but those in intimate daily touch with the trade are disposed to view the future dispassionately and future figures will be determined entirely by the law of supply and demand."

Mr. Challes is a director of the Abitibi Power and Paper Co., whose new mill at Iroquois Falls is now turning out about one hundred and seventy tons of ground wood pulp per day, and a news print mill is under construction which will produce 250 tons daily when in operation. Fraternally, he is a member of

Queen City Lodge, Independent Order of Foresters, Rehoboam Lodge, A.F. and A.M., Cyrene Preceptory and Rameses Temple, Mystic Shrine. Occasionally he does some curling in the winter with the Queen City Club, and in the old days played a pretty fair hand at billiards, but his interests are such that when at home he prefers to spend his time at his own fireside, enjoying a quiet smoke, the daily news and trade press, of which he is a diligent reader.

NORWEGIAN PAPER AND WOOD PULP.

"Farmand" says, September 19th, "The shipments of cellulose to America have been and still are enormous. At present the market for cellulose is quiet, but very firm."

After the large shipments which were made to U. K. after the navigation was reopened the enquiry from that country for mechanical wood pulp has subsided.

A maker of mechanical pulp told us that on Wednesday he received a telegram from a papermaker at Ghent, Belgium, asking if it was possible to charter and the freight and war-risk insurance will certainly be high. Other exporters told us that they had likewise had enquiries from France. The pulp situation will soon be changed, if France and Belgium resume their importations which have been quite stopped since the outbreak of the war.

It is customary that the boards of directors of the Norwegian and the Swedish Wood Pulp associations meet from time to time to discuss matters. This week the Swedish board has been to Christiania. We understand that the two boards considered the situation for mechanical wood pulp on the whole as very good. The Upper Gulf mills have contracts with French papermakers and owing to the uncertainty of France, being able to take these parcels, there was a little nervousness, as these mills are obliged to ship within the close of navigation. It would help them considerably, if they were able to ship in Norwegian vessels, but the Swedish State does not undertake war risk insurance of goods except on Swedish keels. Efforts have been made to get the Norwegian Krigsvareforsikring to insure Swedish wood pulp in Norwegian vessels and this has been arranged.

DROUGHT TESTS FOREST FIRE PROTECTION PLANS.

The efficiency and resources of all forest-protective organizations in Canada have been put to a severe test this year by the prolonged drought which prevailed throughout the greater portion of Canada during the early part of August. It seems probable that 1914 will be recorded as the worst fire year since 1910. The situation in Southern British Columbia has been very serious, and great areas have been burned over in Alberta, on the east slope of the Rocky Mountains. Northern Ontario has suffered severely.

The railways are no longer the chief source of forest fires, and the necessity for a stricter control of the setting of fires by settlers for clearing land is becoming increasingly apparent. Also, in many sections, especially on cut-over lands, where most of the fires originate, the establishment of a more adequate patrol system is essential to protect young growth and prevent the spread of fires into old timber. The extension of the merit system in the appointment of fire rangers in the services of both the Dominion and the Provincial Governments is necessary if the best results in fire protection are to be secured.—Clyde Leavitt, in Conservation.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

FROM OUR LONDON REPRESENTATIVE

To pay a visit to most of the British paper mills, one could hardly realise that we are at war with the "Fatherland," and that we are also in the midst of one of the greatest wars ever experienced in the world's history. Thanks to the British Navy, there are plenty of raw materials in stock, and every day shipments from Scandinavia and Canada are arriving at the principal ports. Compare this state of affairs with Germany and Austria. In Germany, all the newspapers are cut down to the barest minimum, and there is a scarcity of paper owing to mills having to be closed in order that the army may get all the available men. All the newspapers that I have seen lately in London from Germany show that things are in a crucial condition and numerous advertisements have been replaced by notices mourning the loss of relatives killed or wounded in the great European struggle for supremacy. The loss of these advertisements, of course, will tell against the revenue of newspaper and indirectly the paper mills will suffer. In Austria-Hungary there is the same story to tell—in fact, the Austrians are in a more strained position than the Germans. Paper-making is also difficult to carry out in France, but in Finland the pulp and paper industry, while still existing and exporting fairly large quantities, has experienced some difficulty owing to the scarcity of labour. Italy is now reported to be short of sulphite and sulphate for her mills, and the Norwegians and Swedes are troubled with low water in their rivers (which must necessarily reduce the output of mills) and the shipping question. However, shipments from Norway have up to the present time been fairly regular, but at times there is an uncertainty about the arrivals from Sweden. In all cases, Swedish and Finnish pulp and paper have to be carried by neutral ships, but the insurance against war risk has been considerably reduced which adds greatly to shipping movements. So that taking a survey all round, the British, Canadian and the American mills are having a peaceful time for the carrying out of pulp and paper manufacture and between them they should capture a large portion of the markets where the Germans and Austrians have had a good footing. Numerous enquiries are being made in Scandinavia about sulphite and sulphate, owing to the falling off of the German supply, but so far as I can learn, very little business has been transacted with the States.

Prices Firm in England.

Though raw materials have got over the war panic by now, prices of papers in England have not been reduced. Newsprint is changing hands at 3 cents to 3½ cents per lb. and nearly every decent newspaper is laying in stocks which cover hundreds of tons. Mills making newsprint are consequently running full capacity. In order, classes of papers such as art, tinted printings, writing papers, banks, wrappings, etc., mills are busily engaged. In thin papers, such as thin arts and thin printings, etc., Germany was a good supplier and no doubt there may be in the near future a shortage in the supply of these cheap commodities. There is also likely to be a shortage in paper for photographic purposes, as the French mills have their

staffs serving in the war. Water conditions prevent photographic papers from being made here in England—at least that is the contention—an consequently the French and Germans had all the trade. Prices of all fine and colored papers are still on the higher basis, and will keep so.

The Supplies of Pulp.

Since the second and third week in September, British mill owners have been purchasing large supplies of sulphite and sulphate. The demand towards the end of September fell off somewhat, so that only small parcels are changing hands at prices which are on a high basis, owing to the cost of shipping, insurances, etc., which usually arise in war time. In my last despatch to the Pulp and Paper Magazine I gave the total imports of pulps for August. Since the end of August the arrivals up to the third week in September, the latest figures issued by the Custom House to me, are as follows:—Chemical (bleached) dry, 1,368 tons; chemical (unbleached) dry, 48,822 tons; chemical, wet, 1,530 tons; groundwood, dry, 550 tons; groundwood, moist, 54,550 tons. This is practically three weeks' supply of pulps. On new business, cash was against documents. Of the totals, Canada supplied about 13,000 tons of ground wood and Newfoundland about 4,000 tons, the rest mostly coming from Norway. Prices in London may be quoted in or about the following region, ground wood being much cheaper:—Sulphite bleached (No. 1) \$65 to \$72; easy bleaching, \$50 to \$52; "news" or strong quality, \$46 to \$48; unbleached soda (No. 1) \$46 to \$48; kraft, \$46 to \$47; groundwood, moist, \$10.60 to \$12; groundwood, dry, \$24 to \$25.

Prices are e.i.f. London and other British ports. In Scandinavia reports are current that the low water is materially affecting the output of the pulp mills, and prices are inclined to reach a higher level. German and Austrian pulp mills are practically closed, owing to the scarcity of labor.

Esparto is arriving in small quantities, and prices are very high. In fact, stocks of esparto are very small. A good trade is being done in rags, and prices have advanced all round for all grades.

Chemicals and Fillings.

In the chemical markets business is not so brisk. Alkali companies are doing very well, so much so that the ordinary £1 shares in the United Alkali Company have advanced 100 per cent since the end of August. In many respects the chemical trade in England is receiving a great stimulus by the elimination of German competition and better prices are being secured. The slight set-back at present is not due to dullness in paper trade, but to the low state of the cotton industry. Bleaching powder can be bought in spot lots at \$34, caustic soda, 77 per cent, at \$24.50, 76 per cent at \$24 and 60 to 62 per cent at \$34 to \$35. Sulphur is scarce and rosin is plentiful and cheap. In fillings, china clay contracts can be made with considerable concessions. The output is reduced as the demand has been reduced. Mineral white is getting very scarce and large supplies of terra alba are being used in place of French chalk.

Pulp and Paper News

G. A. Howell, Toronto, has returned from an extended business trip through Ohio and other middle west states. He reports that the paper mills are fairly busy and are looking forward to improved conditions.

As soon as the Transcontinental railway is running and reasonable freight rates obtained, many outside buyers of pulp wood are expected to go into New Ontario and widen the market for the settlers' timber. The New Ontario Colonization Company, of Jacksonboro, Ont., are going ahead with the building of roads and the erection of houses and carrying on their plans of development in the way of making preparations to promote settlement and, with the sale of pulp concessions, other expansions industrially and agriculturally may be expected in the near future. Hon. W. H. Hearst, the new Premier of Ontario, who is retaining the portfolio of Lands, Forests and Mines, which he has ably filled for the past three years, in an address to the people of the province has pointed out that stock is now being taken of the value of the natural resources of the province, particularly of timber and pulp wood from which a very substantial portion of the revenue of Ontario has been derived in the past; and it is expected that at an early date the province will have as complete information as possible with reference to its natural resources so that the Government may be the better able to determine the value of these resources from a revenue producing standpoint for the future and the best means of conserving and dealing with them to secure the most beneficial results.

Manley Chew, of Midland, formerly Member of Parliament for East Simcoe, has purchased from the Ontario Government thirty-six square miles of fire-swept and damaged timber at \$8.50 per thousand feet and two dollars timber dues.

The Abitibi Power and Paper Co. are now turning out about one hundred and seventy tons a day at their ground wood plant at Iroquois Falls and are preparing to take out great quantities of pulp wood during the coming season. A town site is being laid out, and a sewerage and waterworks system installed, while houses are being erected for the workmen. Good progress is being made on construction of the new paper mill which, it is expected, will be in operation by May or June next and will have an output of about two hundred and fifty tons per day.

The Canada Paper Company has sent out to the trade a neat card, printed in red and blue on coated litho blanks, six ply, bearing the motto "Business as Usual." Attached to the card is a slip printed in blue, on grey tinted art paper, snede finish, reproducing a short editorial from a Toronto paper on the advisability of adopting and living up to the motto during the progress of the war.

The Don Valley Paper Mills, Toronto, are turning out several new cover papers known as Thorncliffe Covers, which come in buff, lavender, wateau, platinum, cadet blue, Nile green, and shrimp. Like many other paper firms, the company are now featuring on all their samples the words "Made in Canada."

The provisions of the Ontario Workman's Compensation Act will come into effect on January 1st next. An order-in-council has just been passed extending until October 31 the time in which manufacturers must file lists of employes and pay rolls with Commission who are now holding regular sittings in order to get matters into shape.

Ottawa Notes

Ottawa, Ont., October 10.—The low water situation has now reached an acute stage in Ottawa. The water is now within an inch or so of the lowest record known since 1858 and as a result the E. B. Eddy Company, Ltd., has been forced to close down two of its paper mills, throwing 112 men out of work.

The officials of the company state, however, that they are determined to do as much as possible to give employment to their men and with this in view have planned to operate their pulp and paper mills alternately. It is impossible to run both at the same time as the water has reached such a dangerously low level. However, the pulp mills will be run for a time and the paper mills then kept going with the supply thus produced and so on. The water is now lower in the Ottawa than it has been since the company was first established over half a century ago, with the exception of one year.

The J. R. Booth Company, which some time ago had to close down its saw mills as a result of lack of head at the Chaudiere, is still doing its best to keep its pulp and paper mills going but there is of course the prospect that if conditions do not improve it will have to further curtail its operations in this respect.

Some \$5,000 worth of lumber of different kinds was destroyed last week in a fire in the lumber yards of the Gilmour and Hughson Company at Hull. Only able work by the Hull fire brigade prevented a conflagration which would have burned the millions of feet of saw lumber and pulpwood in the yards. As it was about 150,000 feet of lumber was destroyed.

Local newspapers which scattered extras broadcast at the beginning of the war are beginning to curtail these editions somewhat and the size of regular editions is also being cut down. As these conditions are according to report being duplicated in many other Canadian cities it is being anticipated that the somewhat extraordinary demand for news print for extras which was a feature at the beginning of the war will drop somewhat. However, on account of the stoppage of the American supply of Norwegian pulp it is believed that the United States will supply a demand greater than Canadian mills can fill quite apart from home consumption.

In spite of the attractive market for Canadian pulp and paper presented by the present situation the outbreak of war has put a stop to the incorporation at Ottawa of pulp and paper companies, formerly so active. Scarcely a single company of this kind has received letters patent in the last three months where formerly they were being organized at an average of one per week.

The Canadian Trade and Commerce Department is being flooded with inquiries from Europe for Canadian pulp and paper products. Recent inquiries of this kind related to the procuring in Canada of printing, wrapping and every other kind of paper used in the manufacture of stationery, sandpaper, pulp, leatherboard, pulpboard, etc.

MAC.

CANADIANS HONORED.

Mr. J. B. White, manager of the woods department and sawmills of the Riordon Pulp and Paper Co., has been appointed a member of the Forestry Committee of the American National Wholesale Lumber Dealers' Association for the ensuing year. The other Canadian member appointed to this committee is Mr. John S. Gillies, of the Gillies Lumber Company, of Braeside, Ont.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Taggart Paper Company of Watertown, N.Y., has been placed on the so-called profit sharing plan. Eight of the old employes who have been associated in the paper-making business for a quarter of a century, and whom have been important factors in helping the company to make money, will become stockholders. The company will continue to be conducted under the direction of Geo. C. Sherman, and will be increased from a \$100,000 to a million dollar corporation. The company owns and operates two mills, one at Felts Mills, and the other at Great Bend, N.Y. Newsprint is turned out at the rate of over thirty-five tons daily, and this will be largely increased in the future. To this end the company is preparing to build a new dam on the Black River for more power.

* * *

Mr. Sherman has been secretary and treasurer of the Taggart Paper Company for twenty-six years. He succeeded the late W. W. Taggart, while D. M. Anderson had for many years been president of the company. About a month ago, Mr. Sherman purchased Mr. Anderson's interest and is now president. His daughter, Mrs. Katherine Sherman Fox, is vice-president, and J. Victor Baron is secretary and treasurer. Through Mr. Sherman's benevolence, none of those taken into the company will be forced to advance a dollar. Each receives a big slice of the stock, the total being something over one-half of the entire amount, so that although Mr. Sherman is the main stockholder, the control goes to those who now become members of the concern. The profit year by year will be applied in paying each man's share. On the other hand, this deal provides an unquestioned source of revenue for Mr. Sherman's family in case of his demise, and at the same time shifts from his shoulders a large amount of active responsibility.

* * *

Harry Gould, of Lyons Falls, N.Y., whose name has been mentioned as the probable successor of D. M. Anderson, as general manager of the St. Regis Paper Company, will not be named to the position. One of the officers of the company made this statement last week, and supplemented it with the information that the position is still vacant, and is likely to remain so for some time to come. While Mr. Gould is regarded as one of the most capable men in the paper-making industry in northern New York, he is a man of wealth, and would prefer to remain at Lyons Falls in his present capacity in connection with the G. H. P. Gould interests.

* * *

Maine paper manufacturers, in common with lumber interests, will not cut as much timber during the coming year as last. Fred A. Gilbert who is in charge of the spruce wood interests of the Great Northern Paper Company says that he has been instructed by the President, Garrett Schenck, to cut 80,000,000 feet of spruce this year. Last year, this company cut 120,000,000 feet on the Penobscot and Kennebec River waters. Vice-President N. C. Ayer, of the Eastern Manufacturing Company, stated that his company will probably not cut as many logs this year as last on account of the dull condition of the lumber market. The demand for

paper is strong, and the company has an average supply of pulpwood on hand.

* * *

The American Box Board Company, of Grand Rapids, Mich., which has just completed the erection of a big new plant, has taken over a fibreboard plant located in Battle Creek, Mich., and is moving the plant to the new structure erected in Grand Rapids. Practically all of the employees who worked in Battle Creek will go to Grand Rapids to work in the new plant.

* * *

The Colin Gardner Paper Company, of Middletown, O., is installing a new power plant. The plans for the plant involve quite an improvement. The foundations are already in on the strip of ground between the Miami River and mill race. The plans and specifications for the boilers and stacks will be ready in a few days, when the work of installation will be rushed to completion.

* * *

Walter E. Byrne, formerly with the Union Bag and Paper Company, at Kaukauna, Wis., but who some time ago took a position with the company at Roanoke Rapids, North Carolina, has been transferred to Thorold, Ontario, and is now in the employ of the Beaver Company, Ltd.

* * *

The J. H. Horne and Sons Co., of Lawrence, Mass., is loading for shipment the large 160-inch machine built for the Brompton Pulp and Paper Machine Co. of East Angus, P. Q. This is the largest machine that has been built in Lawrence. It has 40 four-foot dryers, 3 presses and a 75-foot fourdrier with adjustable pitch. This company is also building beaters and Jordans for the same mill.

* * *

The Allen plant of the Union Bag and Paper Company of Glens Falls, N.Y., was obliged to suspend operations last week owing to lack of water. The stream is nearly as low now as it has been at any time during the summer. A heavy rain is needed to keep the manufacturing plants humming.

* * *

The Mountain Mill Paper Company has a gang of men at work on their newly purchased Forest mill. The big wooden water wheel, which has been buried in rubbish for 25 years, has been dug out and experts say it is as good as ever. This wheel is quite noted. It was placed in the mill by Benton and Garfield nearly 50 years ago, and was one of the biggest wooden water-wheels in any of the seventeen mills then in Lee, Mass.

* * *

Fred. J. Motz, for the past few years manager of the Wabash Mill of United Paper Board Company, has been appointed manager of the Wabash Coating Mills, of Wabash, Ind., and will in the future look after the affairs of both plants. Mr. Millspaugh, former manager of the Coating Mills, will devote his time to the purchase of straw for the United Paper Board Company, and will also be engaged in the sale of United products.

Advices received in the East from San Francisco, Cal., tell of the purchase of all of the properties of Crown-Columbia Paper Company and the Williamette Pulp and Paper Company, following the organization of the Crown-Williamette Paper Company with a capitalization of \$13,000,000. William Pierce Johnson is the president of the Williamette Company, and it is more than probable that he will be the president of the new company, and that Louis Bloek, of the Crown-Columbia Company, will be the vice-president and general manager. Some of the new eastern capital may be represented among the officers. The combination, it is announced was in the interest of economy, and to meet the competition of Scandinavian and Canadian mills, which have been active in Pacific Coast markets since the removal of the tariff. W. P. Johnson is now in the East on business connected with the new proposition. The daily capacity of the various plants of the new company is in excess of 450 tons of print paper, wrapping paper for citrus fruit, and paper bags. The principal plants of the companies are at Camas, Washington, Oregon City, Ore., and Floriston, California. Plants for printing citrus wrapping paper are maintained at Los Angeles and at Sanford, Florida.

* * *

News was received at Fulton, N.Y., last week that the Canadian creditors of the Battle Island Paper Company have no particular objections to the sale of the timber lands and rossing plant. The Ontario Paper Company is bidding for the Canadian plant and timber, and in case the sale is made it is understood that Judge Ray will allow the sulphate mill north of Fulton to open. Enough wood to run the plant for a few weeks is already on hand, and more can be obtained. Fires have been kept in the boilers so that the digesters would not deteriorate, and with many modern improvements added in the last few years, the mill is considered one of the best in the country.

* * *

What promises to be a large and very influential organization for the industries of New England in their fight for equitable freight rates and demurrage charges is the newly-formed New England Industries Demurrage Committee. The Executive Committee of this association is composed of fifteen members representing New England Chambers of Commerce, and among the paper manufacturing representatives on the committee are F. H. Babbitt of Robertson Paper Company, Bellows Falls, Vt.; D. W. Linton, of the Berlin Mills Company; C. H. Tiffany, traffic manager New England Paper and Pulp Traffic Association, and P. J. Dowd, of the Hamden County Traffic Association of Holyoke, Mass.

* * *

The paper laboratory of the Department of Agriculture at Washington is now testing out a new machine to measure the translucency of paper, which has just been completed by the inventor. It is said at the laboratory that the new venture seems to do all that is claimed for it.

* * *

The Chemical Paper Company of Holyoke, Mass., has awarded the contract for an addition to its plant. The excavation work of the building was started on October 6, and the work of erecting the building will be pushed forward rapidly. Owing to the steady increases in business at the Chemical Paper Company, it was found necessary to erect a large addition to their No. 5 mill, and with the completion of this new mill the concern will be in a position to accept much more business.

The Remington-Martin Paper Company of Watertown, N.Y., will shortly, it is expected change its name to "Remington Paper and Power Company." At a meeting of the reorganization committee held in New York last week the plans of reorganization evolved this plan. It is stated that much progress has been made and that within a short time the companies will be operating under the new plans. The committee has practically decided upon Mark S. Wilder, who has met with much success in his capacity as receiver, and his well known ability as a successful paper manufacturer leads the committee to the hope that he may see his way clear to accept the management of the company when the reorganization is completed.

U.S. STATISTICS.

From the statistics compiled by the American Paper and Pulp Association it will be seen that the paper manufacturers of the United States showed some conservatism during the month of August when there was a state of panic in the trade at large. The board mills alone had any over-production. Newsprint mills showed a tendency to conserve their raw material supplies by running only on contract orders and thus the production tonnage fell off. Shipments, however were 103 per cent of the actual output. The reports show that 88,257 tons of news were made in August, and 90,632 tons were shipped. At the first of September there were 48,427 tons of news on hand, or about ten days' supply.

The reports from wrapping paper manufacturers showed that mills ran on better time during August than any other month in the year. In the twenty-six working days, the mills reporting produced 47,536 tons, and shipped 50,526 tons or 106 per cent of their actual production. Only 28,859 tons were on hand at September 1.

The board mills reporting produced 66,688 tons or about 79 per cent of their normal output for August. Shipments were only 65,769 tons leaving a tonnage of 16,048 on hand at the end of the period.

BIG DEAL IN MAINE.

(Special to Pulp and Paper Magazine.)

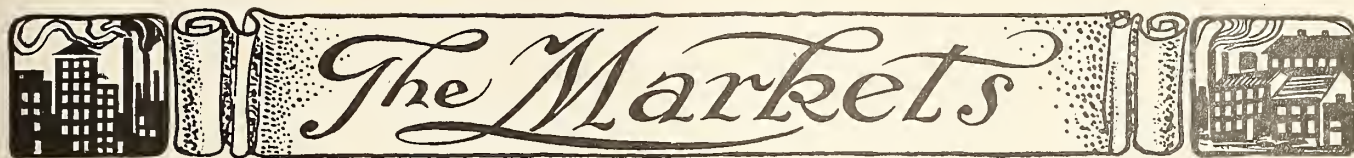
Bangor, Me., October 9, 1914.—One of the biggest transactions in the paper industry of America occurred last week when the Eastern Manufacturing Company of this city bought out the Katahdin Pulp and Paper Company of Lincoln, Me. There has been no mention of the price paid, but it is rumored to have been a very high figure.

The Eastern Manufacturing Company makes a specialty of medium and low grade writings, bonds and envelope papers and has a daily capacity of fifty tons at its mills in South Frewer, Me. Rag and sulphite papers are made by them.

The Katahdin Pulp and Paper Company makes a specialty of manilla envelope and white sulphite specialties. The pulp mill has a capacity of 45 tons daily, and the company has made high bleached and unbleached sulphite in considerable quantity over its own needs for paper making. The paper mill capacity is about 30 tons a day.

Much interest is shown among paper men in this section in regard to the future operation of the Katahdin mills as it is generally known that the Eastern Manufacturing Company has been contemplating some plant extension in order to take care of its customers.

The directors and officers of the Eastern Manufacturing Company succeeded those of the Katahdin Pulp and Paper Company immediately.



The Markets

CANADIAN MARKETS

There are practically no new developments in the pulp and paper field with the exception that conditions are now settling down to a more normal basis. News plants are well employed and running to capacity. Contracts with a number of publishers will expire in a few weeks and, when renewals come up, it will then be seen what figure news print will touch. Some sales managers are talking of obtaining quite a bit over two cents at the mill. Generally speaking publishers are still cutting down the sizes of their paper and issues, which formerly ran sixteen to twenty-four pages a day are now twelve, fourteen and eighteen. This is caused by the fact that advertising is still very low with most dailies for the fall season. Book and writing plants are beginning to feel the effect of the war and most of the machines are running only five days per week. Trade papers and weekly periodicals which have used much book paper in the past, are reducing reading matter and it is estimated that the demand is lessened by at least fifteen per cent if not more. Catalog houses and mail order firms are not sending out as much literature and this too, has caused a falling off.

English representatives of import houses have been in Canada during the past days interviewing certain paper firms with a view of securing high class book, bond and ledger papers in case anything should happen their own plants and to replace certain kinds of paper that have been imported heretofore from Germany.

On thing noticeable about the news print turned out now by a number of mills is that it has a creamy color where it was formerly bluish white. This is caused by the fact that the stocks of ultra marine are running very low and the color cannot be obtained any longer from abroad. There has been an advance of about ten per cent on all heavy colored papers owing to the advances in aniline dyes. In some cases the increases have been very sharp, and the manufacturers do not know where their future supply is coming from.

It may be stated that if the market were at all firm there would likely be an advance of a general character in book and writing papers. Some mills, whose contract for sulphite pulp, has expired are paying several dollars a ton more for the product and can only get quotations covering a month as the chemical pulp plants are taking every step to safeguard themselves but they have not made exorbitant increases. They are doing everything in their power to keep down the figure and protect customers. Many contracts will expire at the end of the year and then there may be a decided advance in book and writing quotations.

Ground wood pulp holds firm in price although the number of inquiries has fallen off. Some concerns are reported to be getting as high as \$18 per ton at the plant but generally speaking quotations remain from \$22 to \$25 delivered, while sulphite holds firm around \$45 to \$48 per ton delivered. Envelope manufacturers have all withdrawn quotations but there has been no raise in prices except on lines made from imported stock. Plants are only fairly busy. Kraft has been advanced about five to ten per cent, depending on quantity and

wrapping papers hold about the same. Jobbers are disposed to feel their way and are not loading up. In fact, stocks in some wholesale houses are reported quite low. The turnover during the past month has been equal in most cases to last year while a few firms had a small increase. Glazed paper for covering shoe boxes, hat boxes, etc., is in good demand and one mill, making this coated stock, which is run through friction calendars, reports a splendid demand from paper box manufacturers.

Canada last year imported from Germany in kraft, glazed and other lines of paper about \$350,000 while finished products, parcels and packages came in to the value was \$160,000. Now that German importations have been cut off, several box and paper firms are jumping into the breach and filling these demands. Parchment papers, glassine, glassine, onion skins, etc., have been advanced by jobbers about twenty per cent. One Canadian mill is conducting experiments in making grease proof paper and may put this product on the market before long.

The rag and paper stock is in good demand. There is fair activity in hard and soft white shavings but changes in prices in other commodities are few. Manila rope has taken a slump.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$2.00 to \$2.10 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.25 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c to 8c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$18.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$50, delivered in Canada.
 Third sand blues, \$1.60.
 Sulphite (unbleached), \$48 to \$50, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.95, f.o.b. Toronto.
 No. 1 soft white shavings, \$1.85.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.05.
 Heavy ledger stock, \$1.50.

Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 35c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$6.25.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manilarope, 3½ to 3 3-4c.
 No. 1 burlap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

market as certain Canadian and northern New York mills have made inquiries for rather large consignments of pulp during the interval. Prices have stiffened and grinders having agencies in New York have very little pulp available for immediate shipment. Most of them are tied up with contracts extending from November 1 to January 1. All are firm in the quotation of \$17.50 to \$18.25, f.o.b. ground wood mill.

The sulphite situation has shown some tendency to weaken under the indifferent attitude on the part of paper mills. Domestic sulphite has maintained a firm tone, and delivered prices ranged from \$46 to \$50 for No. 1 unbleached.

Rags and bagging of foreign quality and packing have been scarce, but some small shipments arrived at domestic ports in neutral ships and eased the situation somewhat. Domestic rags reflected a quiet tone, but prices remained unchanged.

There is a scarcity of hard white shavings, as all available supplies are moved as rapidly as baled. There are likewise no accumulations of soft whites, as some of the low grade sulphite paper manufacturers have been using large quantities of old papers to conserve their sulphite pulp supplies. Old Manillas and kraits remain in good demand, and scarce. Prices on No. 1 old Manillas ranged from 1.05c to 1.15c a pound and old kraits held stiff at 1.35c. Mixed papers eased off considerably under a falling off in demand and the prevailing quotations during the last week has been about 35 cents a hundred weight.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2⅓ to 2¼ f.o.b. mill.
 Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.
 Bleached Sulphite, domestic, 3c to 3.35c.
 Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
 Easy Bleaching, impt., 2.75, ex dock, New York.
 Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.
 Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
 Kraft Pulp, 2.20 to 2.30 ex. dock, New York.

Paper.

Amongst jobbers there was reported a fairly quiet market during the interval. That stocks of practically all grades are low is not denied, as jobbers have found it practically impossible to stock up under the firmness of the manufacturers' policy to deliver nothing but orders for immediate supplies. Mills reported fairly good running time during the interval. Some have been held up for several weeks on deliveries, while others are in a position to deliver immediately. There has been a heavy consumption of newsprint on contract roll business, as business with the publishers has begun to show improvement and larger circulation in all papers is reported. Transient business has been quiet, but values are about \$2.00 a ton higher than before the war began. There is a steady demand for sheets at 2.35c f.o.b. to New York. Side runs have been in good demand at 2.25c f.o.b. New York, and are now a little more plentiful. The book-paper situation has shown slight improvement, and some western mills have advanced prices on cheaper grades about ¼c a pound. Wrappings have eased off considerably in demand, but prices remain unchanged. Most demand is spotty. Kraft papers have been hold-

NEW YORK MARKETS

New York, N.Y., October 12, 1914.

There has been a strengthening of the ground wood

ing up fairly well at 33¼c. The tissue market reflected a healthy tone and prices are high. No. 1 whites and Manillas enjoy a fair demand at 47½c a ream. Colored is in quieter tone, but prices are quoted between 55c and 60c. The bag business has shown a little quieter tone, but values are firm. Boards are quiet, but prices have stiffened.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manilla jute, 5¼c to 5½c, delivered.
 Manilla, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.

Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47½ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

IN SWEDEN.

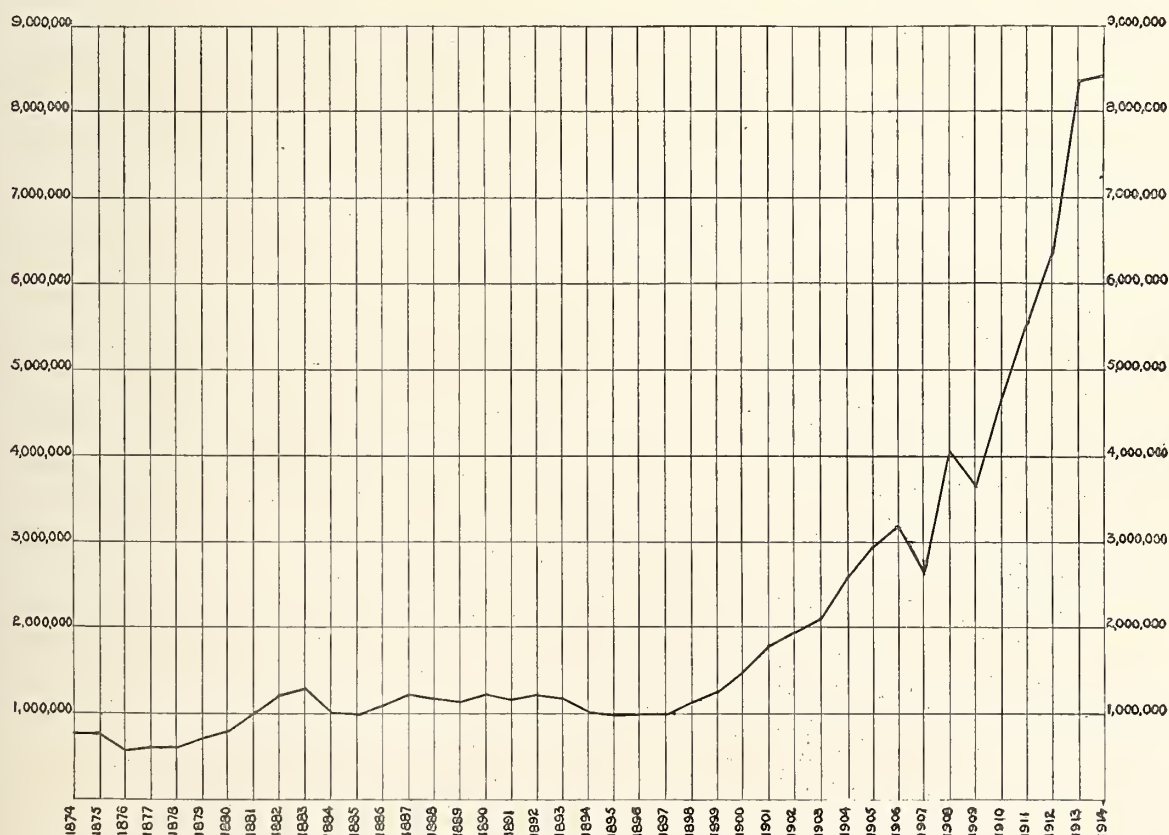
Affarsvarlden says, September 16, of the Swedish wood pulp trade: Mechanical pulp: No sales of any importance have been made during the past week, but buyers have made very urgent calls for deliveries on old contracts. Prices are unchanged.

Chemical pulp: As mentioned last week British papermakers had bought very large parcels for prompt delivery, especially strong sulphite, but during the last days they have bought a further 10,000 tons at unchanged prices, viz., Kr. 160:—165:—clear net fob cash payment for strong sulphite and about Kr. 175:—clear net fob for easy bleaching sulphite. Some sales have also recently been made to the United States of America of bleached sulphite at prices of Kr. 225:—230:—clear net fob.

Of sulphate only very small parcels are in the market for prompt delivery, as the new mills are not ready. Prices for prompt are about Kr. 145:—clear net fob cash payment, and such parcels as may be available are meeting with a strong demand especially from America.

The employes of several wholesale paper houses in Toronto have donated an entire day's pay to the Canadian Patriotic Fund. The employes of the mills of the Lanrentide Co., at Grand Mere, Que., recently gave one day's wages which amounted to about three thousand dollars.

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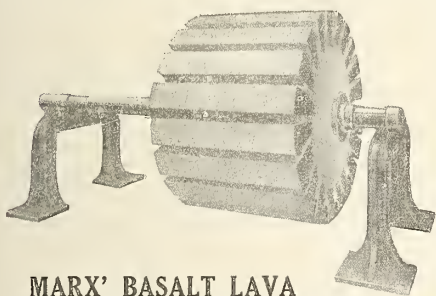
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Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England
- Pneumatic Thickeners**
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
Lombard & Co., Boston, Mass.
Stancilffe Estates Co., Ltd., Darley Dale, England.
- Pumps**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Pusey & Jones Company, Wilmington, Del.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.
- Recording Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Rice, Barton & Fales, Worcester, Ma
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd. Montreal, Can.
- Rotary Silver Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alls**
Boving & Co., of Canada, Limited, Toronto, Ont.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
- Shear Legs**
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Pusey & Jones Company, Wilmington, Del.
Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smeiting Furnaces**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
Pickles, W. F., Buckland, Conn.
- Stuff Chests**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
- Sulphur**
Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.
- Tachometers (Hand and Stationary)**
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes

Blethen, Hugh J. R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurttemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo. Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatichouan Falls Paper Co., Ouatichouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmillier, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merriton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manila,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

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Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

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Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New-
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnacona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," "Hercules Manilla," "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
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McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
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Schofield Paper Co., Ltd., 26-30 Prince William.

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Eastern Supply & Paper Co., 28 Bedford Row.
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Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

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Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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WANTED — Night foreman for mechanical ground wood mill: state experience, references and other particulars. Address "Employer" care Pulp and Paper Magazine, Montreal.

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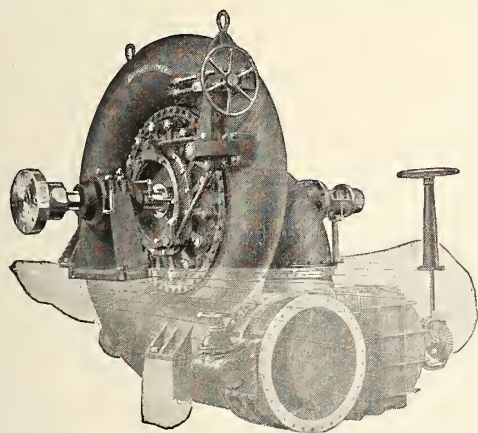
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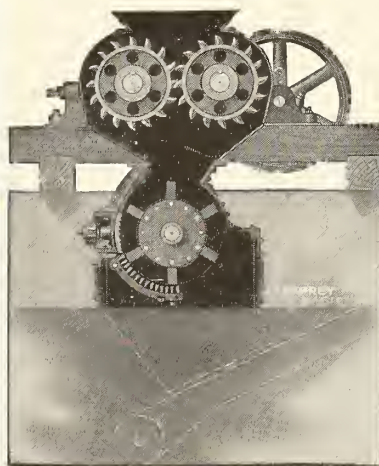
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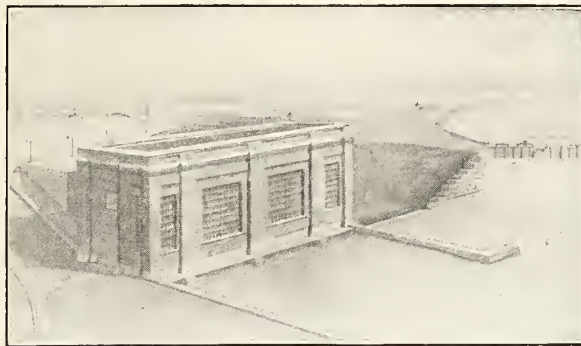
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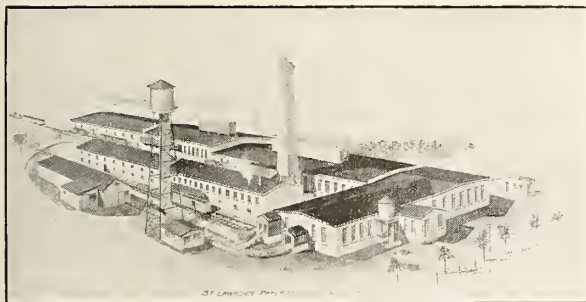
Barber Paper Mill, Georgetown, Ont.



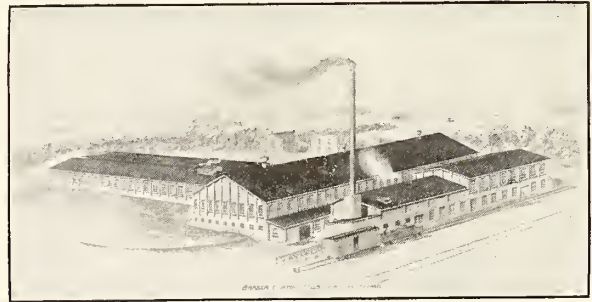
Montrose Paper Mill, Thorold, Ont.



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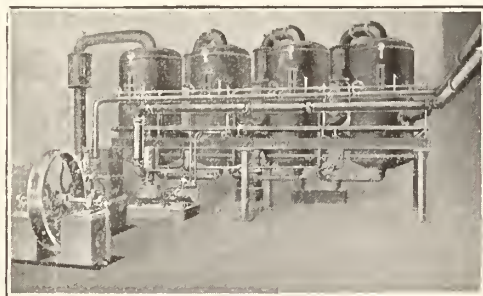
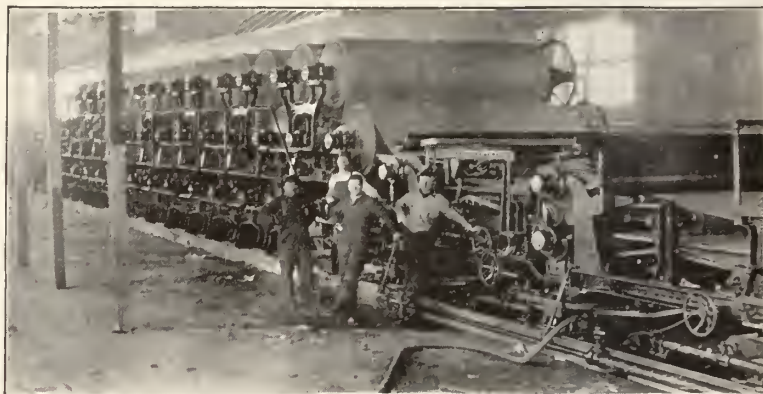
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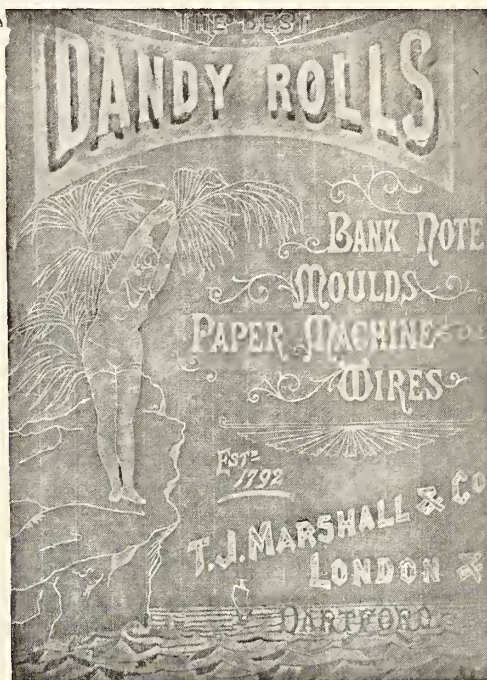
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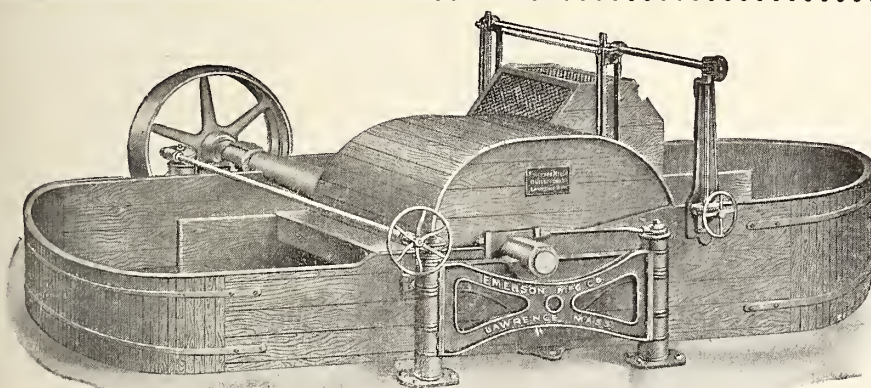
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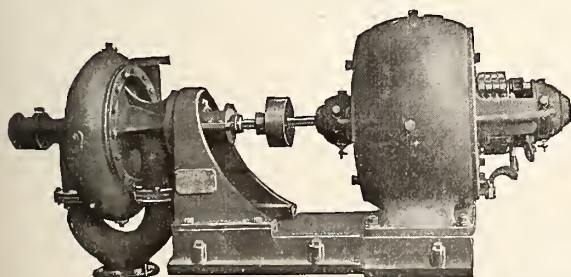
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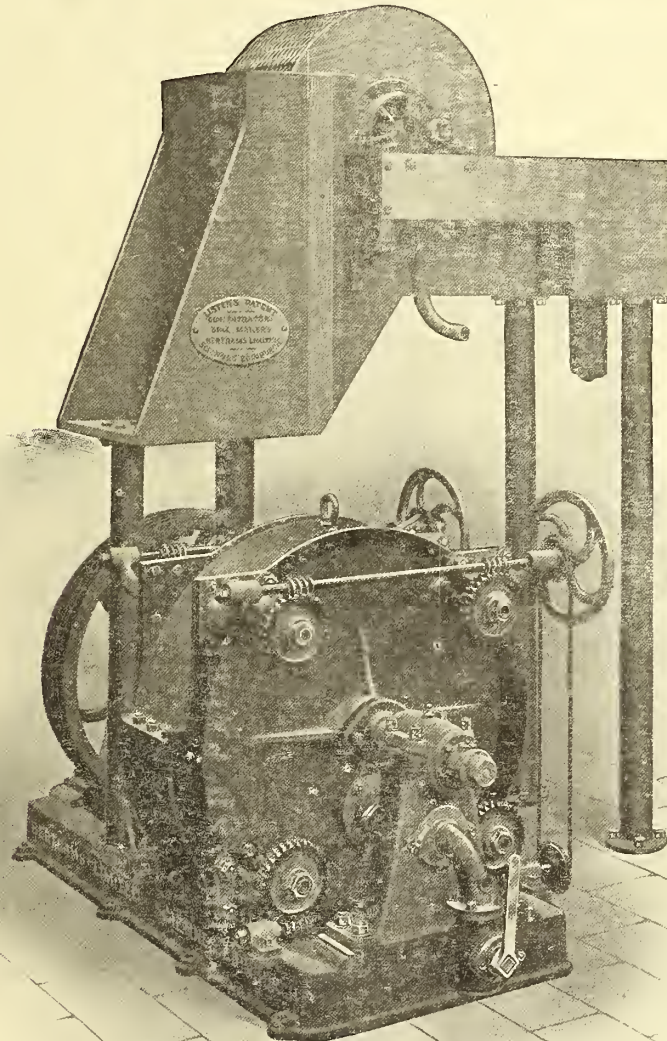
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THE ACTION OF THIS REFINER IS PERFECT
owing to the fact that pulp will not pass through the second set of Bars
UNTIL PROPERLY REDUCED

Fibres which are sufficiently reduced pass easily through, while the unreduced Fibres
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BEFORE THEY CAN PASS OUTWARDS

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is the SAFEST and BEST material for
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and ACID RECLAIMING TANKS

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They are really acid-proof and practically indestructible.

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Saves steam

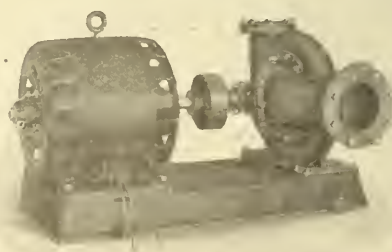
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This regulator gives you a higher and more uniform finished paper with less calendering.

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Our Pumps are in Use from Coast to Coast

Write us regarding your requirements

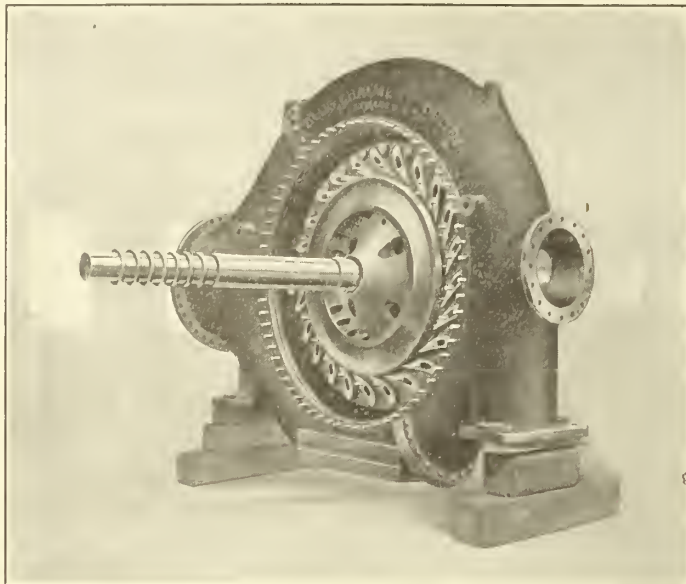


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**Smart-Turner
Machine Co.,**
Limited
HAMILTON, CANADA

PULP AND PAPER MAGAZINE OF CANADA

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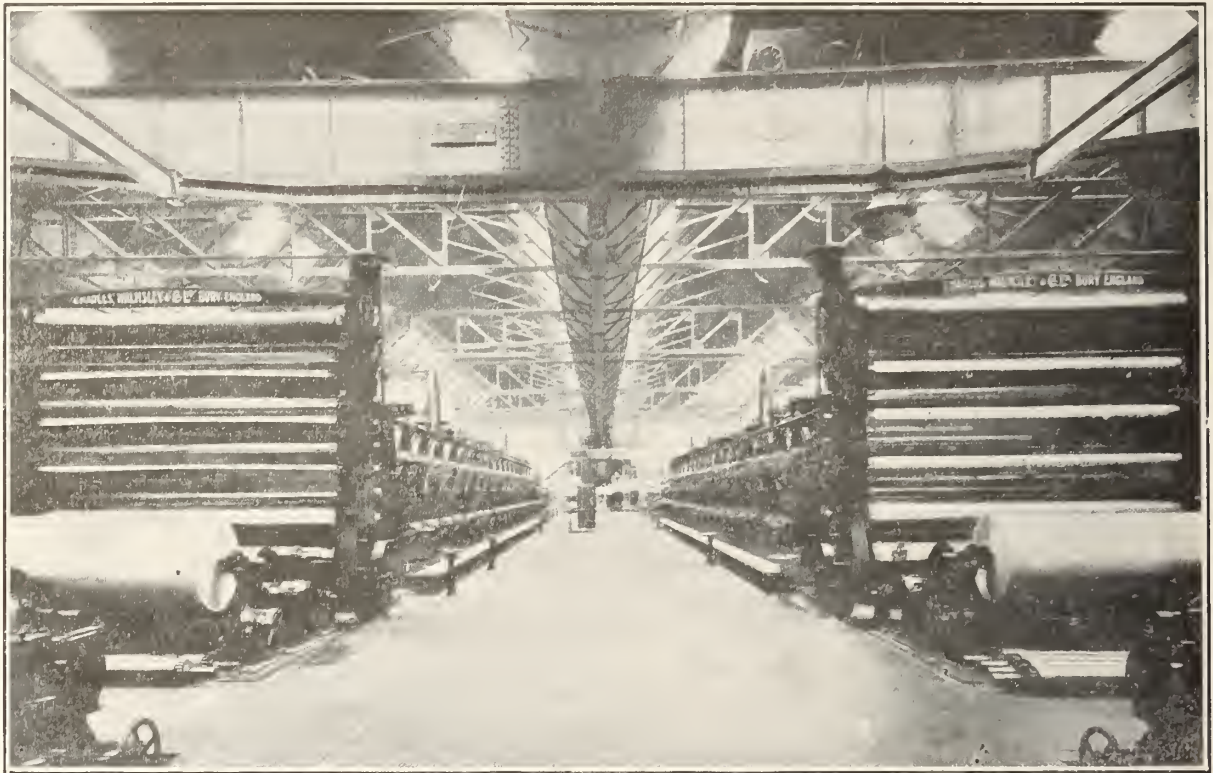
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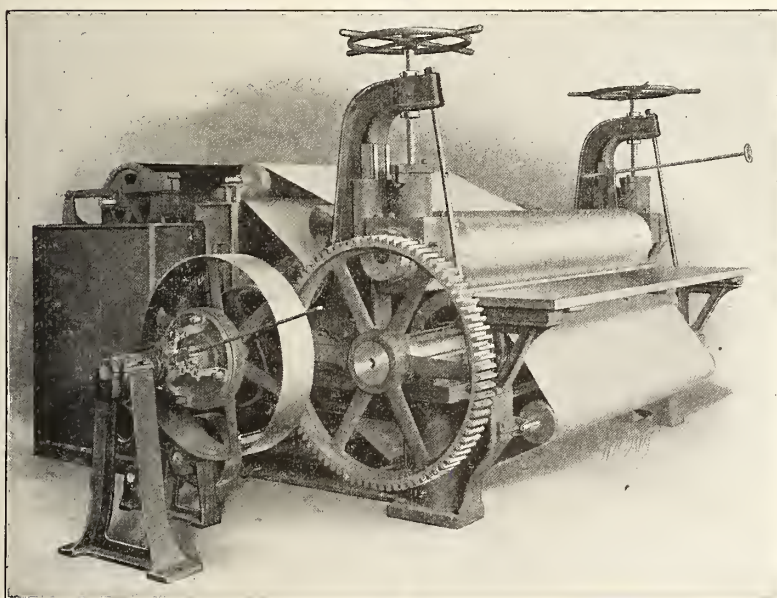
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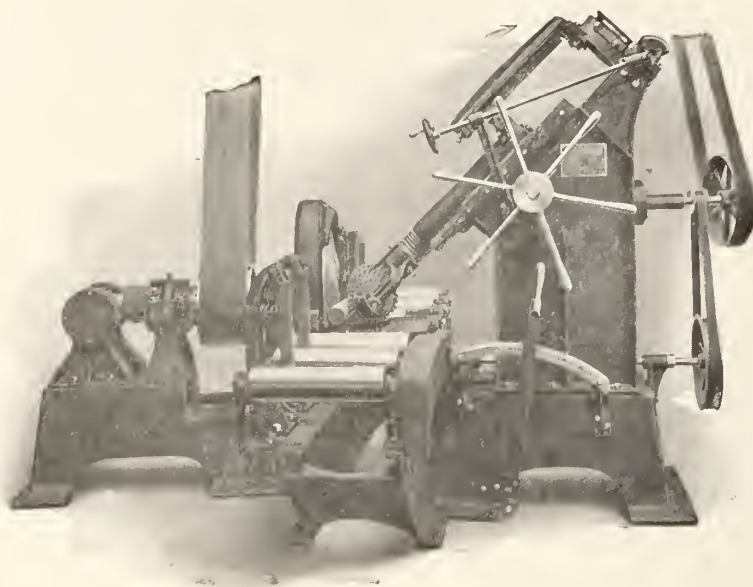
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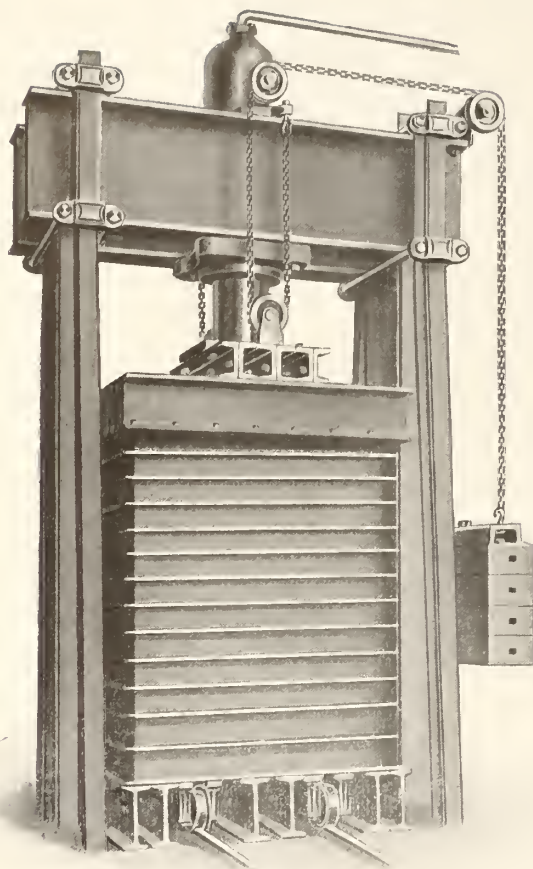
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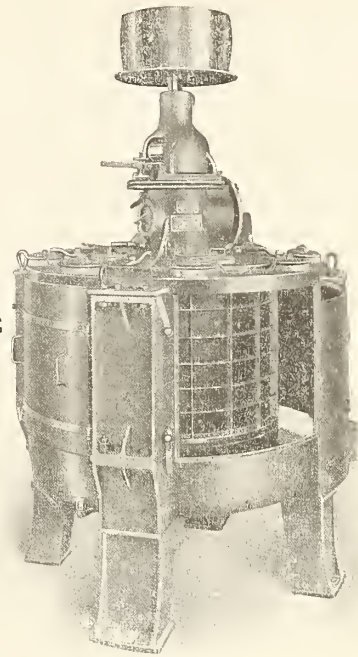
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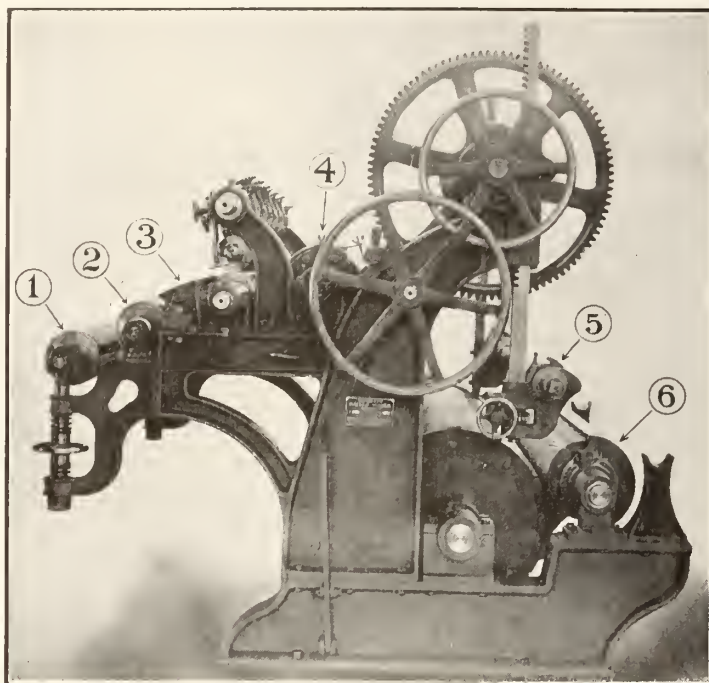
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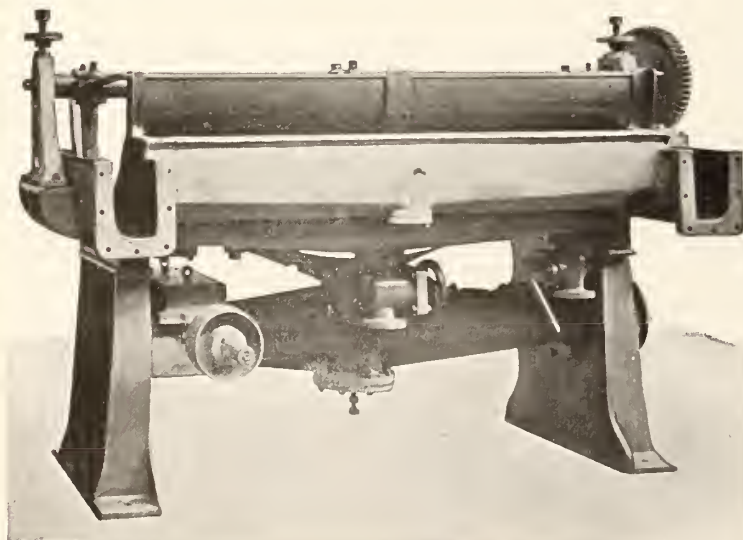
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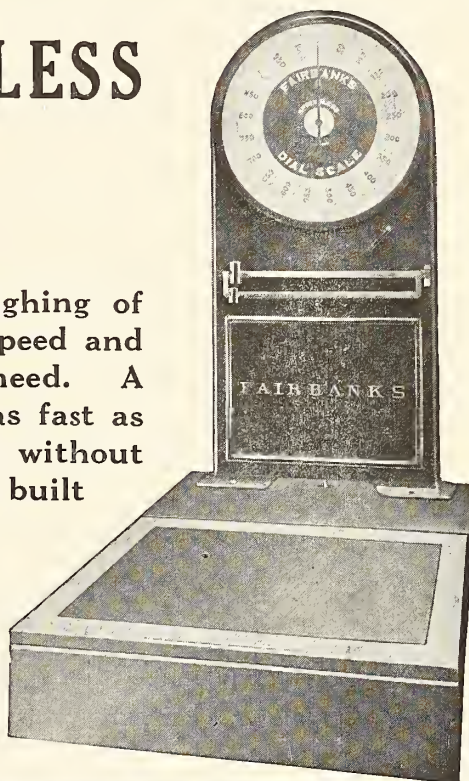
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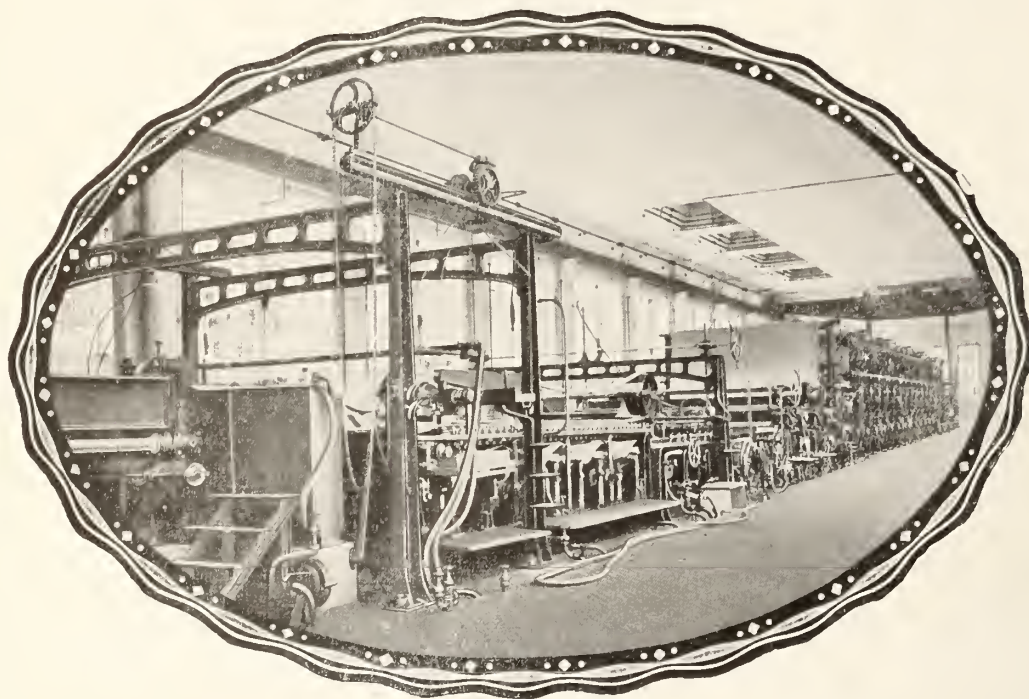
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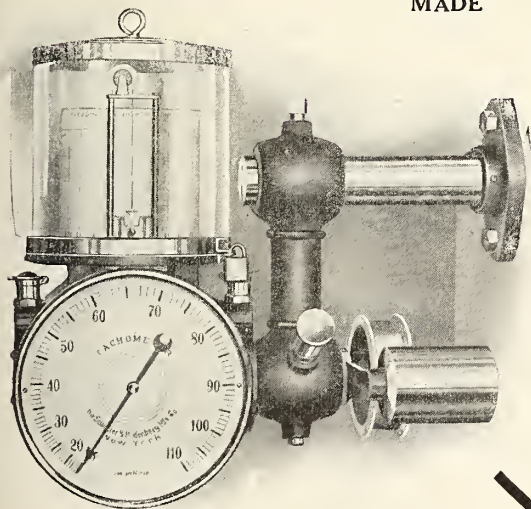
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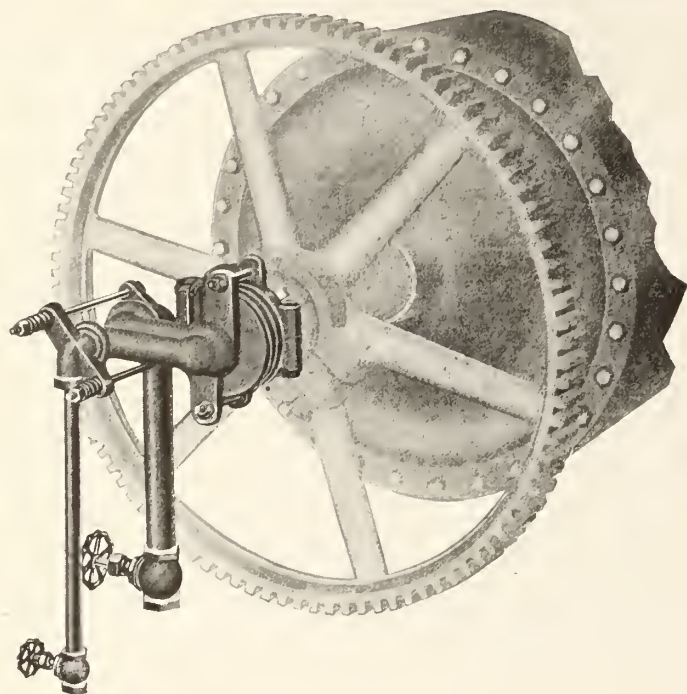
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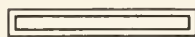
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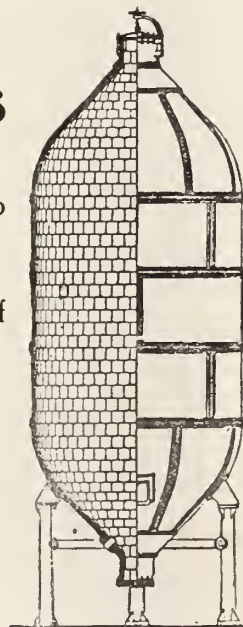
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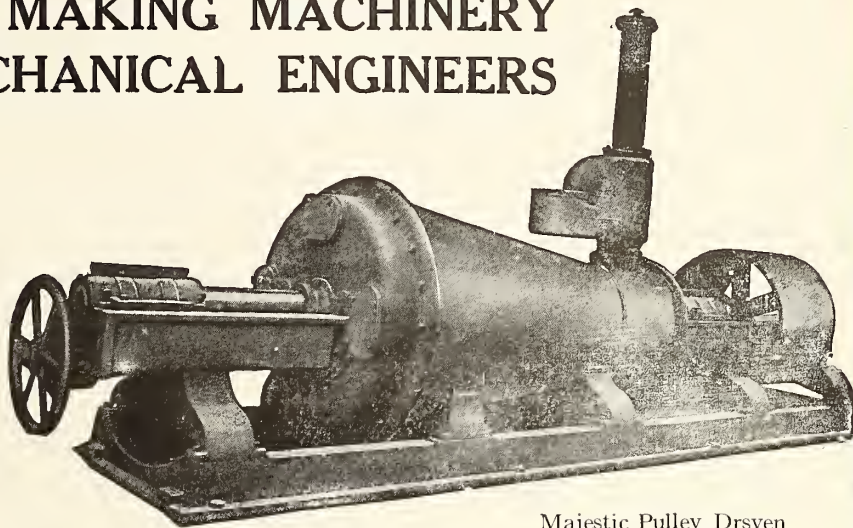
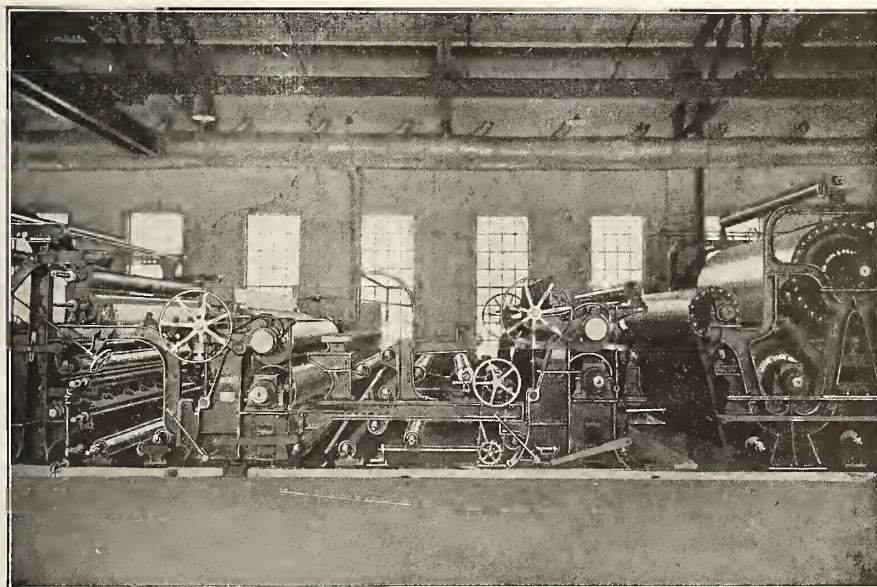
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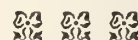
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VOL. XII.

MONTREAL, NOVEMBER 1, 1914

No. 21

DO WE NEED MORE MILLS?

According to the London correspondent of the Pulp and Paper Magazine, whose contribution appeals in a later page, Lieut.-Col. the Hon. P. Pelletier, Agent-General in London, for the Province of Quebec has been making public the wonderful resources of the Province, with a view to interesting English capital in pulp and paper enterprises. The statement attributed to Col. Pelletier is:—

“The present time also offers rich rewards to anyone who will establish paper and pulp mills in Quebec. The existing plants are unable to fill the orders they have on hand. There is abundant supply of cheap water power available—in fact, in some cities it is practically given away to new companies who will establish bona fide industries.” Beyond this our correspondent gives us little information. It is to be hoped that the Provincial authorities will add to their excellent and constantly-growing knowledge of the natural resources of their domain, a thorough study of existing plants and the markets. Undoubtedly pulp and newsprint are in demand at the present time, and certainly the forests and waterpowers of Quebec will ultimately be united in such a way as to make Canada the leading pulp and paper factor in the world. The only question is, is it true that there must therefore be an immediate development in the industry in the way that the Agent-General indicates, i.e., by the establishment of new plants? The forest industries of Canada have suffered badly in the past from over-development, and questionable flotations. It would indeed be a pity if by well meant enthusiasm insufficiently advised, one of our own loyal representatives should incur any risk to British capital or to Canadian industry.

LITERATURE WANTED.

The Forest Products Laboratories of Canada are making a special effort to make as complete as possible their collection of books, bulletins, pamphlets and other literature on pulp and paper, and on forest products in general. An excellent start has already been made and those books and other publications which may be considered standard are, for the most part, already on file. It is hoped to build up in Montreal a large collection of existing literature on these subjects and to keep it up to date. The information contained in the chief libraries of our cities and towns is surprisingly small. It is felt that a special forest products library would be of immense value to the pulp and paper industry, as well as to the lumber, wood preserving, wood distillation and allied industries. The library of the Laboratories will be housed in the new headquarters at 700 University Street, Montreal, and will be open to the public for reference. The Laboratories will also undertake to furnish information on processes used in treating wood and on products manufactured from wood as raw material.

To carry out these plans the Laboratories ask the support of those who have at heart the welfare of our great Canadian forests and the industries dependent on these forests. Special difficulty has been found in obtaining back numbers of important periodicals and journals. The Superintendent of the Laboratories has called on the “Pulp and Paper Magazine” for back numbers (prior to January 1st, 1914) of our periodical, and two important German journals, “Papierfabrikant” and “Wochenblatt für Papierfabrikation.” We have gladly turned over what we had of these and other journals with the knowledge that they will be care-

fully reviewed and indexed and preserved for the benefit of the Laboratories and the paper industry at large. However, the files of these journals are far from being complete and the Laboratories, through the columns of this magazine, wish to learn the names of those who have back numbers of the above journals on file and with whom the Laboratories might communicate in reference to procuring these files either temporarily or permanently. This is a matter which warrants the careful attention of parties possessing these journals for the reason that the information contained therein will be systematically arranged and made available to the industry at large. Communications should be addressed to Superintendent, Forest Products Laboratories of Canada, McGill University.

DYESTUFFS.

One outstanding economic relation which has been brought out by the present war is the practical dependence of the rest of the world upon Germany for its supplies of dyes, particularly the aniline colors. England is now wholly cut off from the usual source of supply, and only a fraction of usual consignments has reached America.

The situation is most difficult. Neither England or the United States is willing to undertake the manufacture of these dyes if the war is going to last only a short time, particularly as the possibility of success in such an enterprise is dependent upon factors which have long been peculiar to Germany alone. The patient persevering temperament of the German chemist has found its reward in just such painstaking work, and in facing the problem the Anglo-Saxon chemists realize that they lack the minute details of a highly specialized industry.

In England committees are actively at work endeavoring to find the way out of the difficulty. They have arrived, as a recent London paper says, after a great deal of discussion, at two policies, between which a choice must be made "the first, the policy of devising some sort of emergency organization to tide the trade over until the end of the war and the German chemical industry is supplying England again; the second, the policy of making a bold attack on the German industry, on such a scale as to attempt to displace it permanently. The difficulties of the larger scheme are acknowledged by its partisans. It would need a capital of millions—rather vague, but certainly considerable number of millions; and, as we should not have the accumulated works' experience of the Germans, it would be at least three years before British production was anything like so efficient and economical as the large scale production of the German firms. If the war were to come to and end before this stage had been reached the industry would be exposed to the competition of the German firms, and the capital might be lost. The fear of this is responsible for the suggestion now being made in some quarters that a State

subsidy, or an import duty system, should be established to guarantee the existence of the industry until it had found its feet."

A member of one of the two most prominent chemical firms in England, to whom the country looks for leadership in setting up the dye industry, says that it is hopeless to endeavor to replace the German goods. German patents cover the whole field, and would require an immense amount of study. German capital has run into the hundreds of millions, and the German research system, which forms the basis for it all is not in any wise duplicated in England.

In the United States the position is practically the same, although United States chemists are laying very broad claims for the permanent establishment of the industry.

In reference to increasing the domestic production of dyestuffs, the New York section of the American Chemical Society held a meeting recently and voted a committee to examine into the feasibility of such a step and report to the section on November 6. The committee is looking for suggestions of a very definite and practical nature.

It looks now as though in both countries a great many dyes would have to be passed over for the present. The situation in Canada, which, as a country manufacturing practically no dyes, and removed from the import of German colors, even through the United States, is likely to be very acute. This is one of the sacrifices of the war, and one of the tributes to the ideal of peace.

THE COURSE OF THE WAR.

The man who asks "when will the war end," is in one sense one of the most discouraging individuals extant. He is quite often the pessimist or the little mind who is hopelessly bewildered by the awfulness of the social and economic upheaval, above all he is often the indolent, complaining man who does not realize that war should mean every man to the front—be it of battle or of business.

But there are those who are looking at this question with the most earnest desire to understand some of the outstanding conditions of the conflict to place business in its strongest position during the disturbances.

Such a man is Mr. W. D. Lighthall, of Montreal, who writes to the public press the results of patient questioning and analysis in respect to this matter. Mr. Lighthall is one of the foremost of Canadian legal minds, and an author and lecturer of repute. His studies lead him to the conclusion that the real question is not which side will win, but of how soon the exhaustion or practical exhaustion of Germany and Austria will arrive. Mr. Lighthall finds some authorities view the question from the point of view of finance, others that of provisions and ammunition, others the loss of men, and still others the possibility of a revolution or internal disaster to our enemies.

1.—From the finance point of view, LeRoy Beaulieu, the most distinguished expert in the world, considers the end of the war should arrive about seven months from August 1st, in other words, about the beginning of March.

2.—This agrees substantially with the opinion of the London "Economist" in August last, that the resources of Germany would probably become practically exhausted in about six months.

3.—The losses of Germany in men, including her casualty list, and the losses from other causes than those included in the casualty list, are admitted in Berlin to be over 700,000, and are calculated by a number of the world's military experts to approach 1,000,000. As these are her first line troops of which she has about 4,000,000 available for fighting, and as this is her real effective army, that army would be reduced to half in about six months from the beginning. It is true that there may be less losses from fighting in the winter; but the losses from disease and privation, will probably more than make up the difference. With only 2,000,000 available first line troops, she could not hope to carry on the war against the overwhelming numbers on both sides.

4.—As for the corresponding losses of the allies, they are practically negligible, because Germany is bleeding at both ends, while each of them is at the present time both England, France and Russia, far more powerful in their resources, and their combination is therefore overwhelming. Austria is left out of the question, because it is useless on the western line and paralyzed on the eastern.

5.—It will be noticed that all these estimates based on the opinions of the leading statisticians of the world, point to the close of the war before next spring, if not during the winter. Other important causes may enter to shorten the date, such as the overthrow of the Militaristic party from within (in which event peace will be comparatively easy), or particular exhaustion in some necessity, like horses, the life of which is very short, and of which it does not appear that Germany has or can obtain a sufficient supply. The possibility of revolution or discontent, or the break up of the Austrian Alliance may also form features, but these would only accelerate the date. On the other hand it may be somewhat delayed by some very remarkable German victory, or by some extreme stiffness on the part of the allies concerning terms of possible peace.

6.—The opinions of purely military men have fixed much longer dates, but these are scarcely of the same value of those of statistical experts.

Mr. O. W. Porritt, of the new amalgamation of Joseph Porritt and Sons, Ltd., J. H. Spencer and Sons, Samuel Porritt and Sons, and Porritt Bros. and Austin, who has been visiting Canada, is accounted an exceptionally generous donor to the Patriotic Fund in England with a subscription of £1,000.

MOISTURE QUESTION UP.

(Special to Pulp and Paper Magazine.)

New York, October 25.

The Associated Dealers in Paper Mill Supplies of New York met on October 14, and discussed a plan that is in the hands of a special committee, for determining a more equitable basis of purchase and sale of bagging in which there is moisture. It is the hope of the Association that a fair average percentage of moisture can be determined and a rule adopted that will do justice to the dealers and mills.

A number of experiments have been performed showing the average moisture, but these have not been formally adopted by the committee.

TRANSPORTATION IMPROVED

Van Buren, Me., October 24th.—The completion of the new railroad bridge connecting the Bangor and Aron stock R. R. at Van Buren, Me., with the Canadian Pacific, Grand Trunk Pacific and International railways at St. Leonards, N.B., by spanning the St. John River at this point, provides another convenient source of supply of Canadian pulp wood for the Maine mills.

Along the line of the International Railway, which connects Campbellton on the Bay Chaleur with St. Leonards on the St. John River, there is a rich lumber section, which already supplies some of the saw mills at Van Buren with logs. With an all rail connection it is expected that a considerable supply of pulp wood will find its way into Maine from this section each season.

Work has just been commenced on the bridge, and under the terms of the contract it is to be completed by March 1, 1915. Its cost will be in the vicinity of \$250,000, and it is owned by the Van Buren Bridge Company.

Not only will it provide an outlet into the United States for the lumber interests, but also the fishing interests on the Bay Chaleur, bringing the Boston market in close touch. The deep water terminal of the Bangor and Aroostook Railroad at Stockton, Me., will provide a winter shipping point for the connecting railroads in the Dominion if the occasion arises for its use.

OBITUARY.

Frank W. Robertson, Hinsdale, Vt.

Frank William Robertson, one of Hinsdale's most prominent citizens, died Saturday night, October 11, after a long illness with kidney trouble. He has been in declining health the past few years, and almost exactly a year and a half ago he had a severe illness, from which he rallied but partly, and ever since requiring the services of a nurse.

For generations back the Robertsons were paper manufacturers, and he naturally took up that pursuit, joining his father in the business in 1870, under the firm name of Robertson and Son. Ten years later he sold out his interest to his brother, George A., and forming a partnership with another brother, Edwin C. bought a paper mill in Holyoke, Mass., and operated the same for two years. In 1882 the brothers returned to Hinsdale and built a mill at Lower Ashuelot, which has since been operated with success under the firm name of Robertson Bros. The product of the plant is high grade tissue paper.

NORWEGIAN WOOD PULP, CELLULOSE AND PAPER INDUSTRY

ISSUED BY THE NORWEGIAN WOOD PULP ASSOCIATION, THE NORWEGIAN CELLULOSE ASSOCIATION, AND THE NORWEGIAN ASSOCIATION OF PAPER MANUFACTURERS. EDITED BY THE SECRETARY OF THE ASSOCIATION OF NORWEGIAN MANUFACTURERS: N. W. ROGSTAD.

INTRODUCTORY

We can hardly imagine now the difficulties in finding suitable writing materials which men had to overcome when they started to communicate with each other in writing. Before the use of paper several things were used. In olden times men used pieces of wood, bark of birch and mulberry, tiles, stone, palm leaves, bamboo sticks, metal slabs, etc. Later on writing material made of vegetable substance was used. The Egyptians very early learned how to make a kind of paper sheet which they obtained from the bark of the papyrus plant. This art they transferred later on to the Greeks. The Chinese long before the Christian era made paper from plant fibres and rags, but their invention did not reach Europe even in the Middle Ages, and when the papyrus plant could not be obtained more, hides were prepared for the use of writing material and this was called parchment after the place from which the best product was obtained.

At last the Arabs and the Moros brought the art of papermaking from China and the first paper mills were erected about the year 1300 in Germany and Italy and a little later in France. In England and Holland the paper industry was introduced at the end of the 15th century and was developed, especially in Holland, through improved methods of reducing of materials used. The machine is called the "Hollander."

After the art of printing was invented the demand for paper increased and this caused numbers of improvements to the methods of papermaking, among these the invention of the real paper machine at the beginning of the 18th century. The call for a better quality of raw material occasioned another substitute for rags, which had hitherto been the only material used.

At first straw was used but later on about 1860-70, spruce and poplar were used, the fibres of which proved to be very well adapted for the manufacture of paper.

Mechanical Wood Pulp.

Friedrich Keller from Sachsen, Germany, invented in 1843 the manufacture of paper from wood. At the time nobody believed that his invention would be of any importance, nor did anybody think that this invention would cause Norwegian timber to be mainly exported as wood pulp instead of as lumber, planks and boards. The wood-grinding machine which Keller had invented was improved by the engineer Heinrich Voelter of Heidenheim, Germany. This improved machine was called "Voeltersehe Defribreuer." Through this machine it was possible with a supply of water to grind wood blocks to fibres which were sorted in a screen, after which the coarse fibres were ground in machines called "refiners." The product then was shaped to board in wet machines, in which the water was pressed out as much as possible. Then

it was shaped in rollers into different sizes and still more water was pressed out through hydraulic presses. The product then was packed in bales. These operations have been retained up to this very time.

About 1870 a great number of paper mills modelled upon the Voelter system were erected in Germany. The paper industry was thus far advanced before people of this country (Norway) understood that this industry was especially adapted for Norway.

About 1866 the first experiment of wood grinding was made in this country, Mr. Karl Meinich started a small plant on Bjoelsen, near Kristiania made by his own people, and ground wood pulp for the Bentsebrug Paper Mill. This example was followed in 1868 by Dr. Tobiesen who ordered two grinding machines (Voelter model) to be constructed at the Kristiania Mekanikal Verksted, and installed a small grinding plant at Bagaas Bruk, on the Akerselven River.

In 1869 Granfos Bruk at Lysaker, Ankers Sliperi at Fredrikshald, and Praestesæter Sliperi at Brummunddalen, were erected. Then followed in 1870: Kongssagene Brugs Sliperi at Modum and Hansen and Kittelsens Sliperi at Skien; in 1871: Labro Sliperi at Skollenborg; in 1872: Embretsfos Bruks Sliperi at AAmot and Lands Sliperi at S. Land; in 1873: Broedrene Foss's Sliperi at Vestfossen, Rygene Sliperi at Arendal, Hofsfos Sliperi and Follum Sliperi at Hoenefos; in 1874: Funnefos Sliperi at Saeterstoen, Hunsfos Sliperi and Hegermans Sliperier per Kristianssand and Langstol Sliperi at Skien.

However, all these plants in Germany, Norway, Sweden and other countries, caused the price of wood-pulp to drop so much that the plants were unable to yield a reasonable profit, although at that time the production of wood pulp was rather small (In Norway about 30,000 "wet-tons" per year).

Nobody thought at that time that the production of wood pulp would reach above 800,000 "wet-tons" per year 38 years later.

Towards the end of the eighties the demand for wood pulp increased and the prices went up. The cost of producing paper also decreased somewhat on account of improvements as to the machines, and the ideas that Norway was a country especially adapted for producing wood pulp with its vast forests and waterfalls were again held forth, and many new plants were erected. In 1880: Ransfjord Sliperi per Randsfjord, Hoenefos Sliperi at Hoenefos, Mago Sliperi at Eidsvold, Kongsberg Sliperi at Kongsberg and Solskinna Brugs Sliperi at Skien. In 1881: Heen Sliperi at Heen, Barldalens Sliperi at Eidsvold and Skjaerdalens Sliperi at Skjaerdalen; in 1883: Adalens Sliperi at Heen, Baegua Sliperi at Hoenefos; in 1884: Hofsfos Brug at Hoenefos; in 1885: OErje Brugs Sliperi at OErje. In 1886: Grubbe Brug at Skien; in 1888: Glommen Sliperi at Askim, Egeland Sliperi at Risoer and Kalvild Sliperi at Lillesand; in 1889: Kammerfos Sliperi at Krageroe, Fossing Sliperi at Krageroe, Schioetts Sliperi at Skien, Lunner Sliperi at Grua, and

Saugbrugsforeningens Sliperi at Fredrikshald; in 1890: Kistefos Sliperi at Randsfjord, Vafos Sliperi at Krageroe and Ramsfos Sliperi at Kroederen and Cappellens Sliperi at Hollen.

The rapid development of the wood pulp industry again caused falling prices and at the same time the prices of lumber and timber went up on account of the increasing demand, and the business soon did not yield a good profit at all.

The mechanical wood pulp is mainly produced in this country as wet, white spruce pulp in laps of 50 per cent substance and is called "First class wet spruce pulp." This is either produced through "cold grinding" or with small supply of water through "hot grinding." There is also manufactured "dried" spruce pulp in board shape; in one of the mills the pulp is shaped in thin, dried leaves, packed in bales and hydraulically pressed. Also from poplar some pulp is produced. Some mills also produce brown pulp from wood of long fibres which is steamed or boiled.

The production of white and brown spruce pulp in Norway, for sale, wet, in tons (1016 Kgs.) 1890 to 1913:

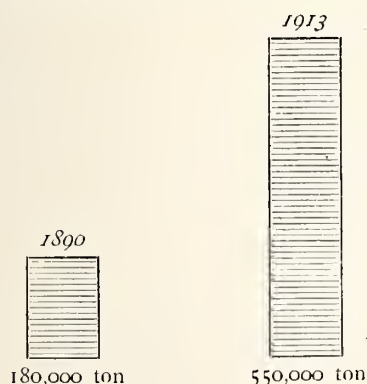
THE PRODUCTION OF WHITE AND BROWN SPRUCE-PULP IN NORWAY. FOR SALE, WET, IN TONS (1016 Kgs) 1890 to 1913.

Year	Production in tons	Year	Production in tons	Year	Production in tons
1890	180,000	1898	289,000	1906	395,500
1891	193,000	1899	313,800	1907	423,000
1892	175,900	1900	313,000	1908	450,000
1893	221,000	1901	312,800	1909	487,000
1893	237,500	1902	357,000	1910	479,000
1895	215,300	1903	347,000	1911	426,000
1896	245,900	1904	327,000	1912	528,000
1897	251,600	1905	345,000	1913	550,000

* No work for some time.

These quantities only represent that part of our production intended for sale. In these figures are not included the pulp used in the making of paper and board. This part of the pulp production, according to the official production statistics of 1909 was 29 per cent of the whole production of pulp. If this relation was the same in 1913 the total production of woodpulp in 1913 should be about 775,000 tons wet. In consideration of the enormous progress of paper production in our country since 1909, an increase of 40 per cent, the real production probably would be about 800,000 tons in 1913 (total production) of which 250,000 tons is used as raw material in the paper industry.

Norway's Production of Woodpulp For Sale.



From the table we learn that our production of wood pulp in 1913 was more than three times as large as in 1890.

In 1909, 59 per cent of the pulp was produced in Eastern Norway. In "Buskerud County" alone 40 per cent of the total yield of the country was produced. In Southern Norway (Bratsberg and Nedenes County) 30 per cent is produced. The rest of the production is divided among the Northern parts of the country.

Cellulose.

(Chemical Pulp.)

As raw material for the manufacture of paper "mechanical wood pulp" has not all desirable qualities. With the exception of the "semi-chemical" or brown wood pulp, which is made by the grinding of steamed wood, paper cannot be made of unmixed mechanical pulp. In the manufacture of paper made of wood pulp, other raw materials can be used, as materials with long, elastic fibres, for instance, wood cellulose. In the manufacturing process these fibres make a mat and the mechanical pulp is filled between the fibres as filling material.

After numerous experiments to find suitable raw materials from trees and fibrous plants for the manufacture of paper, the production of cellulose from the tree by the chemical process was begun. Considered as an industry, the beginning of this production by the chemical process was made at the middle of the sixties, when the first plants were erected in England and United States of America.

The chemical wood pulp or cellulose is cooked at a high temperature (120 to 180 degrees Centigrade) in large, closed boilers. After the bark has been removed the wood, which is cut in small pieces, is poured into these boilers together with the liquid that shall dissolve the "sap." If the liquid is a "lye" which contains caustic soda or sodium sulphide the product is called "soda cellulose" or sulphate cellulose. If the acid contains a sulphite, as a general rule calcium bisulphite with an excess of sulphurous acid, the product is called sulphite cellulose.

After the dissolution of the wood-incrusts, these are washed away, the wood-cellulose remains as short or long fibres. This gives a splendid raw material for almost any kind of paper. In unbleached condition soda is used, and the sulphate cellulose mostly for better classes of wrapping paper, envelopes, etc., while unbleached sulphite cellulose is used for newspapers and all kinds of cheap printing paper. In the bleached condition both soda and sulphite cellulose are used for better class of book and writing paper.

The soda cellulose industry originated, as before mentioned, in England and the United States of America. Sweden, however, started the first sulphite cellulose mill. The plant at Bergvik near Soederhamn, was started at the end of the seventies by the inventor Karl Daniel Ekman (1845 to 1904). He kept the details of the cooking a secret to himself, and the real creator of the sulphite industry, therefore, is the German chemist, Professor Mitscherlich, who took his patents out about the same time as Ekman. Contrary to the proceeding of Ekman, he at once started plants at the beginning of the eighties all over the world.

The first Norwegian plant for the manufacture of chemical wood pulp (cellulose) was started in 1874 at Hafslund by the engineer F. Stoermer (1839-1900). It was based on the soda method. Later, on the initiative of this great inventor, and according to his

plans, mills at Moss, Ranheim and Bamble were erected at the beginning and middle of the eighties. The sulphate cellulose industry has its greatest economic importance through the appliance of all kinds of waste from the saw mills, timber of poor quality and also Scotch pine. This cannot be done by the sulphite process. Modelled on the Mitscherlich system, the first mill, Skien Cellulosefabrik, was erected at Skien, at the beginning of the eighties and the sulphite industry has developed more rapidly than the soda (and sulphate) cellulose industry. In 1885 to 1886 there were four mills of each kind in Norway, but in 1914 the numbers of sulphite plants have increased by 23, producing 265,000 tons. The numbers of the sulphate cellulose mills is only 7 and their production is 55,000 tons.

The table below shows the increase of production of sulphite and sulphate cellulose respectively from 1891 to the present year. The figures are supplied by the Association of Cellulose Manufacturers. While the figures for wood pulp only indicate the production destined for sale, the figures below from the Association of Cellulose Manufacturers also include the production destined for their own use.

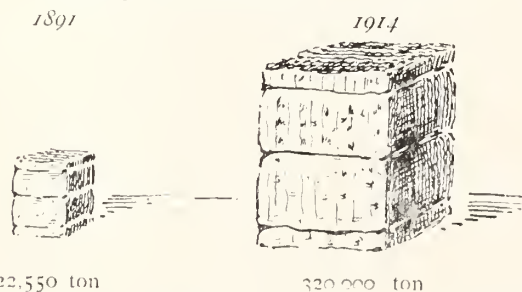
PRODUCTION OF CELLULOSE IN TONS (DRY).
CALCULATED TO BE

Year	Sulphite bleached and unbleached	Sulphate	Together
1891	16,992	5,558	22,550
92	24,000	6,800	30,800
93	29,800	10,200	40,000
94	34,600	10,700	45,300
95	41,600	9,900	51,500
96	53,500	8,500	62,000
97	62,800	11,300	74,100
98	64,800	13,000	77,800
99	70,900	10,100	81,000
1900	102,300	12,700	115,000
1	100,200	12,700	112,900
2	95,700	12,100	107,800
3	97,400	11,000	108,400
4	103,300	15,500	118,800
5	123,500	15,300	138,800
6	144,500	16,600	161,100
7	135,800*	23,500	159,300
8	182,200	26,300	208,500
9	175,900	33,600	209,500
10	191,000	36,800	227,800
11	171,700*	38,000	209,700
12	238,500	43,000	281,500
13	254,000	50,200	304,200
14	265,000	55,000	320,000

* No work for some time.

The production of cellulose in the year 1914, viz.: 320,000 tons, is about 14 times larger than in 1891.

Norway's Production of Cellulose.



Also in the cellulose production the "Buskerud County" is the leading county. In 1909 40 per cent of the total production of cellulose of the country was produced in this county. Eastern and Central Norway has 87 per cent of the total production.

Also in the cellulose industry the rapid increase and development of the production has caused a corresponding fall of prices.

Paper.

The transition from hand-made ("vat") to machine paper, took place at the beginning of last century. We have already mentioned the importance of the invention of the paper machine. It was M. Robert, a Frenchman, who invented the paper machine in 1799. This paper machine forms and drains the paper mass and presses and dries the paper sheet in long, continuous pieces. Robert's invention was later on improved by John Gamble and Bryan Donkin, both Englishmen. The principle of Robert's paper machine has been retained, but, of course, with many improvements as to details. The typical feature is the endless wire, on which the pulp is poured and gets the shape of a continuous paper sheet. The fibres are partly placed lengthwise, and partly across each other and at the same time the first draining is made.

In 1838 the first paper machine was introduced in Norway. This was acquired by Bentse Papirmolle on Akerselven. This paper machine was later on sold to Boehnsdalens Papirfabrik, where it was working until the mill was destroyed by fire in 1908.

It was not until wood was used as raw material that the paper industry grew to be an important industry in the modern sense. The Hollander reduces the ground wood and the cellulose to a pulp mass and during this process fillers, sizes, and dyes are added. These materials are added to give the paper the proper form, weight, color and finish. Having passed through these processes, the mass goes to the paper machine, where the paper is formed on the wire. Thereupon the mass passes through several presses and over drying cylinders and then, according to the requirements, it goes to cutter, calender or roll.

In Norway the paper industry has developed very rapidly. While in 1870 only six paper mills were operating in the country, the number had increased to 16 in 1900, in 1909 to 35, and in 1913 to 38. To these must be added six board and box mills. Reports of the total production of paper in Norway from 1893 is available. These reports, gathered by the Association of Paper Manufacturers, are given below. In these figures, the production of a small mill, which does not belong to the Association is not included. The output of this mill is calculated to be about 450 tons per year, and the paper is all sold in Norway. The figures for 1913 do not include two mills erected in 1912.

PRODUCTION OF PAPER (NOT BOARD) IN TONS:

Year	Total domestic sale in tons	Export tons	Total output. Tons.
1893		19,302	
1900		47,362	
1901		48,088	
1902		49,500	
1903	10,281	53,600	63,881
1904	11,057	61,264	72,321
1905	11,794	82,100	93,804
1906	12,652	93,825	106,477
1907	13,250	94,605	107,855
1908	15,187	109,304	124,491
1909	15,300	124,070	139,370
1910	16,752	140,449	157,201
1911	18,865	131,265*	150,128
1912	21,108	154,448	175,556
1913	23,783	177,305	201,088

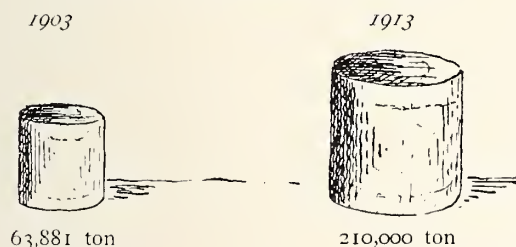
* No work for some time.

From the mills herein mentioned, the total output in 1913 was about 210,000 tons. From the table it appears also that the production during the 11 years from 1903 to 1913 has increased more than three times. In 1913, 80 paper machines were in operation, compared with 67 machines in 1909.

We note with pleasure the ever-increasing sale in the domestic market. 24,233 tons of the domestic paper production were disposed of at home. To this quantity must be added the import of foreign paper, which amounted to 3,454 tons in 1913. The total domestic consumption amounted thus to 27,687 tons, which corresponds to 11.4 kgs. per inhabitant. The corresponding consumption in Denmark and Sweden is 16.2 kgs. and 20.9 kgs. respectively, according to reports for the year 1913. The consumption of paper in our country, it appears, is far below that of our neighboring countries. We can, however, comfort ourselves that in Portugal, Greece, Rumania and Serbia, the consumption, according to Krawany's paper statistics, is only between one and two kilos per inhabitant.

In "Buskerud County" 35 per cent of paper was produced. In "Bratsberg County" the figure is 25 per cent. Eighty-seven per cent of the total paper production is in Eastern and Southern Norway.

Norway's Production of Paper.



Prices of Wood Pulp.

The prices of wood pulp, which from about 1869 to about 1874 declined from about kr. 130 (\$35) to about kr. 90 (\$24) per wet ton, f.o.b. Norwegian port, continued falling until 1899, as shown by the table below. At the same time, timber prices advanced steadily. Raw materials have had a tendency to go up in price up to this present year. Wood pulp has, however, as shown by the table, remained firm with the exception of an advance in price for a short time during the years 1900 to 1902, 1905, 1908, and 1909. The difficulties which this industry has had to overcome are mainly attributed to the disproportionate rise in the price of timber in Norway, as compared with that in other countries with which we have to compete on the market. Owing to higher wages paid nowadays, and other difficulties in connection with the labor question in the mills, higher cost of production, in spite of improvements made in machinery, has come about. All these things are obstacles for the pulp and paper industry of our country. The paper mills, which have their own forests sufficient to meet their demands for raw materials in whole or in part, and are favorably located with cheap water power, are far better off. If money is invested in new plants, forests are also invariably purchased at the same time in connection with the new mill.

Wood Pulp Prices.

Where two prices are given, they indicate the highest and the lowest quotations. Until 1905, prices were quoted for "baled pulp," and later on for "pulp

WOODPULP PRICES

Year	Wet mechanical pulp per English ton (1016 kgs.) \$	Year	Wet mechanical pulp per English ton (1016 kgs.) \$
1877	26	1901	11-10
1880	21	1902	11-8
1885	13	1903	8
1891	10	1904	8-14
1892	10	1905	14-10
1893	11-12	1906	9
1894	12-15	1907	10-15
1895	10-8	1908	15-11
1896	9	1909	12-10
1897	10	1910	10-8
1898	10	1911	9-12
1899	8	1912	9-10
1900	14-16	1913	10-8

packed with staves." The packing is calculated to cost kr. 2.50 (70c.) per ton.

CELLULOSE PRICES.

The following table shows the different prices for sulphite and sulphate cellulose.

Year	Sulphite (strong) per ton	Sulphate (strong) per ton
1891	57	—
1892	51	46
1893	54	48
1894	46	40
1895	38	32
1896	38	33
1897	40	36
1898	39	36
1899	42	35
1900	39	36
1901	38	35
1902	32	32
1903	31	29
1904	33	29
1905	35	36
1906	36	38
1907	35	38
1908	34	37
1909	33	35
1910	32	33
1911	32	33
1912	32	33
1913	35	32

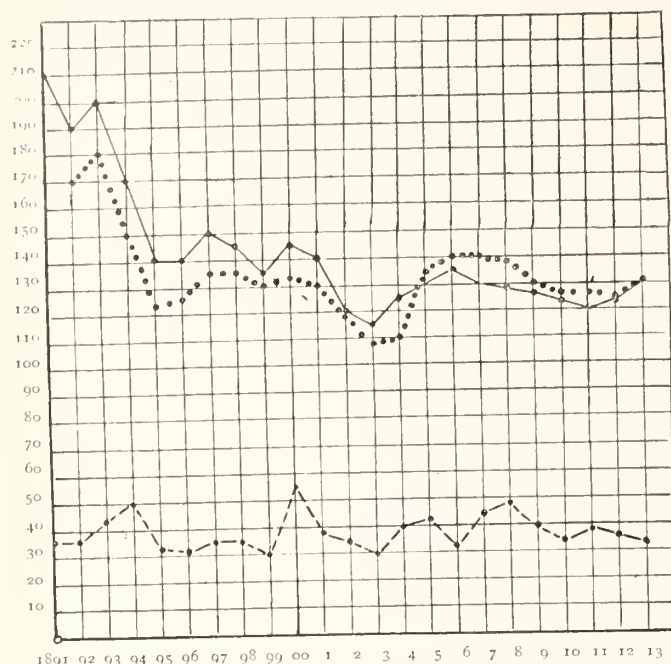
The prices for sulphite from 1891 to 1904 are taken from the annual reports of "Drammens Traelasthandlerdirektions" (Board of Directors of Drammen Timber Merchants), compared with quotations from the records of "Norsk Cellulose Forening" (Association of Norwegian Cellulose Manufacturers). The reports from 1905 to 1913 are gathered from the office of the "Scandinavian Association of Cellulose Manufacturers" at Stockholm (Sweden).

Cellulose and Wood Pulp Prices, 1891-1913.

The prices sulphate cellulose before 1899 are based on extracts from the records of the "Norsk Celluloseforening." From 1905 the reports have been obtained from "Den Skandinaviske Cellulose Forening's" statistical bureau at Stockholm.

The cellulose prices, both sulphite and sulphate, declined heavily from 1891 to 1903. In this year the lowest price was touched, as the table shows. The prices were in 1903 82 per cent and 58 per cent lower than in 1891, sulphite and sulphate cellulose respectively. Since 1903, prices have had an upward tendency, but are still far below the ruling prices, in the nineties. The diagram explains the movements of

wood pulp and cellulose prices during the years between 1891 and 1913 (in kroner per ton).



Cellulose and Wood Pulp Prices—1891-1913.

Continuous line—Sulphite-cellulose.

Dotted line—Sulphate cellulose.

Dash line—Woodpulp.

Paper Prices.

Comparing paper prices during several years, it must be borne in mind that the different kinds of paper have different prices, and represent different values. It is, therefore, necessary to select some special kinds of paper as standards of value.

The export paper from Norway has mainly during the last few years been reel paper, which is the cheapest kind of printing paper. Therefore, this kind of paper is the best applicable to the determination of movements of prices. The relation between printing paper (by printing paper is meant mainly newspaper, both in rolls and in sheets, also better classes of printing paper, glazed printing paper and glazed, colored printing paper) and wrapping paper (by wrapping paper is also meant sulphite paper, cellulose paper, kraft paper, grease-proof paper and tissue paper) was in 1911 seven parts printing paper to five parts wrapping paper. It might safely be said that reel paper comprises about 50 per cent of Norway's paper exports. Therefore, this kind of paper is well suited to be the standard of value.

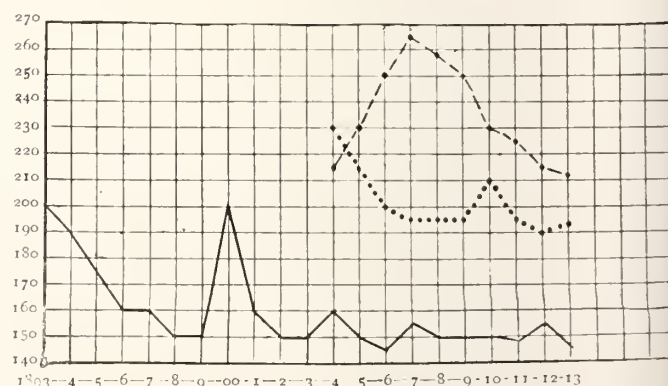
In 1893 the prices for reel paper was kr. 200 (\$54); in 1894 the price declined to kr. 190 (\$51); in 1895 the price fell down to kr. 175 (\$47), and in 1896 to kr. 160 (\$43). In 1898 and 1899 the price fell as low as kr. 150 (\$40).

At this moment, however, something happened, which altered the prices considerably. The Boer war broke out, and the consequence was an increased consumption of paper, especially in England, but also partly in other English-speaking countries, so that the demand could not be met. At the same time the prices of wood pulp were forced up to an unusual height, owing to several circumstances, such as scarcity of water, heavy exports to the United States, etc., so that prices up to kr. 60 (\$16) were obtained for wet wood pulp.

In 1900, without any difficulty, prices as far up as kr. 200 (\$54) were paid for reel paper. On the other hand, several agreements for delivery of paper had previously been effected, so that this sudden rise of prices did not benefit all the mills. After the Boer war, prices gave way and in 1901 the price quotation was about kr. 160 (\$43). Then another decline in prices came in 1902 to 1903, and the prices obtained during these years were only about kr. 150 (\$40). Then followed a slight rise of prices in 1904, viz., about kr. 160 (\$43), and then declined in 1905 to about kr. 150 (\$40), in 1906 still lower, about kr. 145 (\$39). No doubt an overproduction of paper on the market had at that time taken place, and the conditions for the paper industry were very serious.

In 1907 the first labor troubles in the paper industry came up, and several of the largest paper mills were idle during three months on account of strikes. This however, settled the trouble of prices and in 1907 the prices went up to kr. 155 (\$42). Later on nothing has influenced the market which has caused any considerable change of prices, and although there have been some movements up and down, the fluctuations have been comparatively small with a tendency towards lower prices. The prices in the years 1908, 1909 and 1910 have been about kr. 150 (\$40), and in 1911 kr. 148 (\$39.50). At the beginning of 1912 prices went up to kr. 155 (\$42), but at the end of 1912 the market was dull, and in 1913 the tendency has been to falling prices, and prices may be calculated to about kr. 146 (\$39). Especially during the last part of 1913 the market has been very dull.

Besides reel paper, special attention should be given to prices of the different classes of paper for export to China and Japan, viz., "Cap" paper and "thin printing paper." This market is of great importance to the Norwegian paper exporters. Finally one must take prices of kraft paper into consideration, which does not include all kinds of wrapping paper made in Norway, but kraft paper is quite an important part. Kraft is undoubtedly the kind of wrapping paper of which the largest quantity is exported in one quality. The diagram below shows the movements of prices of the different classes of paper. Reports as to reel paper are available from 1893. Reports on the others start at the year 1904.



Prices (in kroner) per 1,000, f.o.b. Norwegian Port.

Cost of Production—The Industry and National Economy.

While the prices of wood pulp, cellulose and paper, as mentioned before, for the last years, have had a

tendency towards falling prices, the increasing demand for these goods has made the price of timber rise every year. The table below shows the timber prices from 1891 for the following four river districts: Glommen, Fredrikshald, Drammen and Skien. The movements of prices will be seen from the table to have kept pace with each other in all districts. These figures represent different standards of measurements as, dozens, loads, cubic feet, and cubic metres, etc. To be able to compare them, we have tried to reduce them to one standard of measurement, viz., cubic metres, fixed measurement, delivered in the river. These prices do not include wages for timber-markers, receivers, etc., and all other expenses incurred later. This reduction has been applied both to the table below and to the following diagram. Dimensions, rules annual reports of the timber merchants' corporations, pensens of floating and other conditions are different in the four districts. The reports on the Drammen district and the Skien district are obtained from the annual reports of the timber merchants' corporations, and the reports for the two other districts are gathered from the consumers. The figures do not give any idea of the cost per ton in one district compared with the other districts, but show how the prices of raw materials have increased in all districts almost at the same time.

PRICE OF ONE CUBIC METRE CELLULOSE AND GRINDING MATERIAL, 1891 to 1914.

Year	Drammen District	Skien District	Glommen District	Fredrikshald District
	\$	\$	\$	\$
1891	1.82	1.62	1.27	—
92	1.88	1.62	1.27	—
93	1.87	1.73	1.13	—
94	2.05	1.84	1.13	—
95	2.00	1.73	1.24	—
96	2.08	1.76	1.24	—
97	2.24	1.90	1.35	1.37
98	2.30	2.17	1.56	—
99	2.30	2.30	1.56	—
1900	2.37	2.43	1.68	—
1	2.42	2.37	1.68	—
2	2.37	2.30	1.51	—
3	2.61	2.30	1.54	—
4	2.61	2.43	1.55	1.46
5	2.78	2.43	1.55	1.53
6	3.03	2.57	1.69	1.62
7	3.46	2.70	1.80	1.53
8	3.51	2.91	1.85	2.11
9	3.46	3.04	1.76	1.97
10	3.51	3.30	1.90	2.21
11	3.88	3.30	2.43	2.22
12	4.05	3.38	2.70	2.43
13	4.18	3.51	3.00	2.87
14	4.05	3.65	3.13	3.00

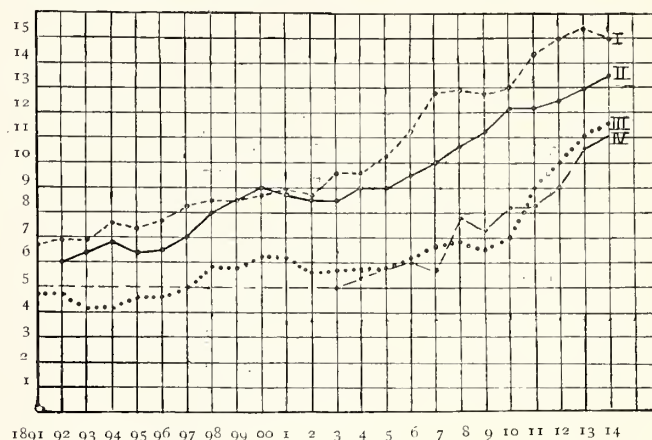
It appears that the rise of price during the last 24 years has been more than kr. 7.00 per cubic metre (\$1.90). This is very important for the country in a social economic sense.

Comparative curves showing the movements of timber for cellulose and grinding material.

The measures are all reduced to one standard of measurement, viz., 1 cubic metre, fixed measure.

Norway's annual output of wet mechanical pulp is about 800,000 tons, and of dry cellulose about 300,000. Calculating a consumption of timber of 1.5 cubic metre, and 5.5 cubic metres per ton respectively, total 2,850,000 cubic metres, the forests yield about kr. 20,000,000 (\$5.4 millions) more than previous to 1891 considering the increase of kr. 7.00 per ton since

that year. Capitalized at 5 per cent, this means an increased value of the forests of the country of about kr. 400 millions (\$108 millions) during the last 24



Comparative curves showing the movements of timber for cellulose and grinding material. The measures are all reduced to one standard of measurement, viz.: one cubic meter, fixed measure. Curve I, Drammen District. Curve II, Skien District. Curve III, Glommen District. Curve IV, Fredrikshald District.

years. It is also very important that timber of poor quality, waste of sawmills, etc., can be used by the sulphate method.

From time to time it appears that some people think that the heavy demand for raw material for the wood pulp and cellulose factories must lead to diminishing the forests of the country. This, however, is due to a misunderstanding.

The wood pulp industry has caused the owners of forests to cut timber of small dimensions. Through this proceeding the ground in the forests is cleared, and the trees get the necessary light and ventilation needful for their growth and propagation. Previously the importance of this care of the forests was not understood properly.

The wages have also increased rapidly during the past few years, and this increase of wages has been comparatively greater in this industry than in any other industry in the country. According to the official statistics, the average wages for adult workmen in the years from 1900 to 1911 were as follows:

Year	The whole industry		Wood pulp, cellulose and paper industry	
	Men	Women	Men	Women
	\$	\$	\$	\$
1900	0.82	0.40	1.31	0.44
1911	1.00	0.50	1.03	0.58

It appears that the wages in 1911, which was the last year for which official statistics could be obtained, were higher in the wood pulp, paper and cellulose industry than the average wages of all other industries of the country. To this must be added that the new tariff, which came into force at the beginning of 1912, means a considerable increase of wages.

The paper "Arbeidsmanden," the paper of the Norwegian Workmen's Association, No. 3, 1914, admits that the wages paid by these industries in Norway are practically the very best wages paid in Europe in this line.

About 14,000 workmen are employed by these industries in Norway. The table below shows the proportion of the total amount of wages paid by the in-

dustry in Norway, appertaining to the cellulose, paper and wood pulp industry. This table is based on official statistics.

Year	Wages paid		Wages in % paid by cell. paper & wood pulp mills, of the total amt of wages paid
	Total industry Mines included	Wood pulp Paper & Cell. mills	
	thousand \$	thousand \$	
1900	14,863	1,555	12.3
1905	15,980	2,126	13.3
1910	27,180	3,591	14.7

A very good idea of the importance of these industries for the country is obtained by considering the figures which these industries represent of the total export from this country. The table below shows that about 50 per cent of the export value must be attributed to cellulose, paper and wood pulp.

Year	Total Export of manufactured goods	Value attributable to paper, wood-pulp and cellulose	% of cellulose paper and wood pulp of the total export of manufactured goods
	million \$	million \$	%
1871-75	1.5	0.11	7.3
1876-80	3.3	0.73	22.5
1881-85	5.1	1.76	32.7
1886-90	7.3	2.69	36.8
1891-95	10.0	4.51	45.6
1896-1900	12.1	7.3	58.3
1901-1905	15.6	9.35	59.7
1906-1910	25.1	11.73	58.2
1911	32.7	16.57	50.0
1912	40.5	20.00	49.2

This table shows how these industries from a very modest start at the beginning of the seventies have developed to be the most important agencies of export from our country.

As to the years 1911 and 1912 (partly) consideration must be given to the fact that a "lock-out" of seven weeks caused such detriment to the export, and hampered the production considerably. The commercial statistics will, therefore, no doubt, give a far better idea of the importance of these industries for the last couple of years.

The following three tables indicate the value of the quantity of the exported wood pulp, cellulose and paper from 1871 to 1912.

Quantity and Value—Wood Pulp.

Year	Woodpulp		Total Value
	Dry	Wet	
	1,000 kg.	1,000 kg.	\$
1871-75		1,605	106,767
1876-80		18,644	462,286
1881-85	9,536	58,400	1,271,351
1886-90	13,194	122,856	1,604,449
1891-95	19,067	165,793	1,940,111
1896-1900	13,715	212,776	2,405,311
1901-1905	13,197	318,199	3,072,903
1906-10	13,538	425,913	1,481,033
1911	16,408	424,473	3,902,000
1912	13,901	484,715	4,857,513

Cellulose.

Year	Cellulose		Total Value
	Dry	Wet	
	1,000 kg.	1,000 kg.	\$
1886-90	7,973	8,348	732,236
1891-95	28,453	9,306	1,549,227
1896-1900	64,885	6,975	2,609,351
1901-1905	90,011	11,702	3,553,319
1906-1910	132,577	4,876	5,186,110
1911	178,781	1,425	7,006,189
1912	193,910	1,066	8,404,027

Board and Paper.

Year	Board and paper	
		Total Value
	1,000 kg.	\$
1866-70	30	12,623
1871-75	323	58,984
1876-80	2,561	261,184
1881-85	3,937	273,946
1886-90	5,848	338,303
1891-95	21,376	1,028,397
1896-1900	42,872	2,169,730
1901-1905	58,975	2,736,135
1906-1910	116,108	5,070,265
1911	131,299	5,636,351
1912	155,867	6,789,081

Value of the Annual Export of:

Woodpulp.
\$0.11 million.



1871-75

Cellulose.
\$0.22 million.



1881-85.

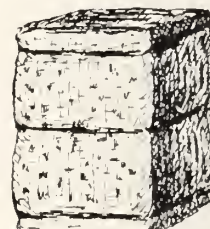
Paper.
\$0.05 million.



1871-75.



1912.
\$7.86 million.



1912.
\$8.40 million.



1912.
\$6.78 million.

Recapitulation.

We have through this article given a synopsis of the history of the wood pulp, cellulose and paper industry, their social economical importance and the conditions prevailing. These industries are calculated to represent at least kr. 100 millions of investments (\$26 mill), costs of water power plants not included, and employ about 14,000 workmen. The production of these industries represent about 50 per cent of the total export-value of the whole country. Moreover, they have caused a very good profit to the timber trade. On the other hand, new difficulties have to be overcome both at home with the labor question and abroad, through a keen competition from the other wood pulp and paper producing countries.

Regarding the present conditions, impartially, the ever-increasing prices of raw materials, especially timber prices, and costs of production, and the decreasing prices of the production from these indus-

tries, which has had this tendency to decline for years, there should be every reason for looking after some means to support these industries which are of such vital importance to our country.

Things have come almost to a climax, so that in case that no betterment can be expected for these industries within some years, these industries, for which

our country has better natural resources than most other countries, soon will disappear. The understanding of this fact is of the utmost importance, and should be thoroughly taken in consideration. The Norwegian people, and above all, the Government of public affairs, must all comprehend what enormous values are at stake for our country.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

MR. CHARLES F. MANSELL

General Manager of the Toronto Paper Manufacturing Company

For the last twenty-six years at precisely the same hour every morning with the regularity of a clock, the steadiness of a land mark and the conservatism of a rural community, a short, rather thickly set gentleman with a cheery "good morning" has stepped into the elevator of the historic Mail Building in Toronto. You can tell by his alert walk and rather off-hand manner that he embodies earnestness, thoroughness and system—if you do not believe it, take a look at his desk at any hour of the day and there is nothing misplaced. He is British to the core and carries all the outward evidences and characteristics of the trained and disciplined man of affairs—the staunch, sturdy type that have made "John Bull" a leader in the commerce of the world, on the high seas, or on the field of battle.

Such a representative is Charles F. Mansell, who has had forty years constant connection with the stationery and paper business. For over a quarter of a century he has been sales manager of the Toronto Paper Manufacturing Company whose plant is located at Cornwall, Ont. The mill was established by John R. Barber, Richard Brown, Ed. Trout, Charles Riordon, Dr. Briggs, and other veterans in the trade in 1880, and a few years later Mr. Mansell joined the organization as sales manager. At that time the plant had one machine, seventy inches wide, and the output was about four to five tons per day. Now the equipment consists of three machines, with a total capacity of twenty-one tons daily of book, bond, ledger, envelope and litho papers, and has a sulphite plant with three digesters. The mill also turns out tub sized, pole dried and air dried papers, together with two platers for linen finish paper. The range of prices is from four and a quarter cents to sixteen cents per pound.

When Mr. Mansell first entered the service the highest priced paper was nine cents, while the average was about five cents, but the product that was then disposed of at the former figure, purchasers would not consider now, so great has been the improvement in texture, quality and finish by reason of up-to-date manufacturing facilities. Although the output has more than quadrupled, it has all been sold by Mr. Mansell, who, for a long period has been a frequent and well known visitor to the wholesale trade in Montreal, Ottawa, Hamilton, London and Toronto with whom he has established a solid and friendly connection.

In old London town he was born but spent the greater portion of his boyhood days in Doncaster, York-

shire, where he attended the Grammar School. Later he took a course in the Caversham Academy at Reading, Berkshire, and his first position was with the wholesale pulp and paper stationery house of Waterlow and Sons in London, where he served an apprenticeship of several years. Then one day he packed his



baggage and started for Canada, the land of opportunity. Landing in Toronto he secured a situation with William Warwick, manufacturing stationer (now Warwick Bros. and Rutter), who was doing business at the corner of Wellington Street and Leader Lane. Here he gained a wider experience and insight into

the trade and, after four years' service, he joined the staff of James Campbell and Sons, wholesale stationers and booksellers, of Front Street West, as buyer and manager. He remained until that house went out of business, then rejoined the Warwick firm and represented them for some time. Meanwhile, the business of the Toronto Paper Manufacturing Company had continued to grow, and Mr. Barber, the president and manager, was looking around for a capable sales manager. Mr. Mansell linked up with him and was in close contact and daily association until the retirement of the former about two years ago. When the controlling interest of the company was transferred to other hands, Mr. Mansell was retained in the position of sales manager, a tribute to his fidelity and activity in the interests of the firm. Naturally, in the course of his career, he has witnessed many changes and several superintendents have come and gone, but there has never been a change in the selling end. A gentleman of the old school he has continued in season and out to make his round of calls upon the trade. His visits are welcome, his promises are fulfilled and his service attentive and courteous. Many young men, who were junior clerks and office boys when he first started, are to-day managers and buyers but the same satisfactory relations have ever been continued, for it

has become an axiom with the trade that, once a customer of the Toronto Paper Manufacturing Company always a customer. A couple of years ago, while taking a walk through a new paper warehouse in Montreal Mr. Mansell had the misfortune to stumble against a pile of paper and fell heavily to the floor, breaking an arm. He started home the next day but the mishap did not deter him from coming down to business. Herein may be seen one of the elements of his success, for he is, to use a colloquial expression—"always on the job."

Of hobbies, he has none but work—except that he has always been a prominent figure in Masonic circles. He is a Past Master of Zeta lodge, a Past Z of Antiquity Chapter, a Past Preceptor of Cyrene Preceptory, Knights Templar, as well as a Past Provincial Prior. He has been treasurer for five years of Ramesses Temple, Mystic Shrine and Grant Treasurer for nine years of the Sovereign Great Priory of Canada, K. T. On the occasion of his retirement from the position of Treasurer of Cyrene Preceptory, he was presented with a cabinet of silver in appreciation of his devoted services. Mr. Mansell is a member of the Board of Trade and, in religion, is an Anglican, attending St. Augustine's Church, of which he is an officer.

REINFORCED CONCRETE LOG CHUTE AND DAM

**EXTENSIVE IMPROVEMENT WORKS BY JAMES McLAREN LUMBER COMPANY AT HIGH FALLS
ON THE LIEVRE RIVER, PROVINCE OF QUEBEC**

By FREDERICK DAVY

There has recently been put into successful operation by the James McLaren Lumber Company, Ltd., of Buckingham, Que., a reinforced concrete log chute, the only one of its kind in Canada—and perhaps in the world. The structure is at High Falls, on the Lievre River, in Quebec, and it is now reported to have been in satisfactory operation for several months. From the standpoint of efficiency in delivering logs it has recorded a great advance over the old timber chute which it replaced, and requires much less water for operation. Moreover, the discharge of the logs is more efficient, as they are delivered parallel to the river surface, thus preventing fraying and splitting of the ends through striking the grave of the somewhat shallow shore. The Lievre River is a stream of good volume and drains an area of 4,000 square miles. At the approach to High Falls it flows over a bed of granite and the sudden drop at that point is about 160 feet. At the head of the Falls the stream is naturally divided into two channels by a rocky island. The smaller of the two is the north channel and in nature the main or south current discharged itself over a rocky precipice in a white foaming mass. The safe delivery of logs over such a place was impossible, so, for years they have been carried down in an old rectangular-bottomed timber built chute. In 1910 the lower section of this structure went out, after doing duty for many years. In planning a replacement it was thought that the fact that the McLaren limits could be made perpetual justified a permanent structure. The company then decided upon a concrete chute to replace the old one

and the discussion of the details concerning it revived a long-cherished desire to improve the advantages of the splendid water power so that it might be utilized so soon as a profitable opportunity presented itself. So, in making the designs for the new chute, it was incorporated as part of a large and excellent scheme of conservation and development.

The scheme included two dams. The more important was across the main or south current. In it were the log chute outlet, the flood gates and provision for five power flumes each capable of furnishing water for a 10,000 h.p. unit. The north dam was designed as a regulating dam and was so constructed as to provide escape for the discharge of exceptionally high water. The log chute was placed to the south of the whole structure.

In 1910-1911 the lower section of the new concrete chute was built and connected with the old section above. As the workable structure thus stood, it comprised 375 feet of concrete and 7,500 feet of timber. Economy in the use of water had to be a guiding principle, as the more water went over the slide the less there would be for power. The V-shape was therefore adopted for the chute as it was considered by far the most saving and adaptable. The design of the chute took into consideration the natural narrowing of the current in the gathering speed of the descent and the height of the sides was gradually decreased towards the foot. The maximum slope of the chute was fixed at 1 in 4, except at the lower end. There, about forty feet from the mouth, the gradient was sharply lessened and changed from a straight line to the arc of a circle

of 225 feet radius. The change of grade being near the point of discharge, the retarding of the speed was so small as to be negligible and the result as designed was to throw up the lower end of the log and cause the drop to be made horizontally to the water. The upper end of the concrete chute was finished in July 1912, and used for the discharge of the logs that year, but it was not until the completion of the whole work

blasted for the dam a ledge of the country-rock (grey granite) was left and against this the footing of the dam abuts. The dam has three regulating sluices. The piers between them are approximately in the shape of a long ellipse. The stop-logs for the regulating sluices are of Douglas fir and are twenty-two feet long, thirty-six inches deep, and vary from fourteen to twenty-two inches in thickness. The steam-log winch for hand-

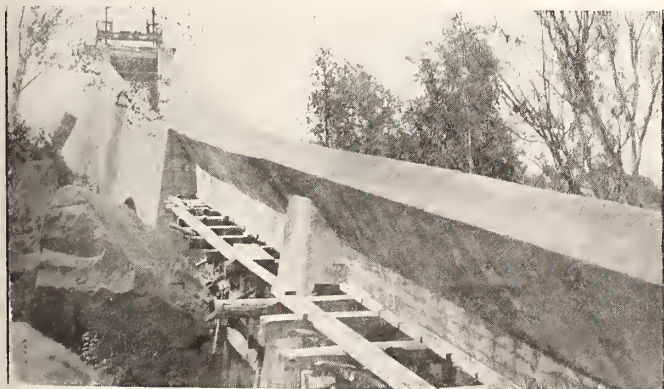


James MacLaren Lumber Company's dam and log chute at High Falls.

that the full efficiency was realized. This year the working of the permanent structure has more than justified the expectations of the engineer and the company. The new structure uses less water, discharges more logs and requires fewer men. The old slide required from fourteen to sixteen men to operate it and it discharged from 12,000 to 15,000 logs in ten hours. The new slide can be worked by six men and will discharge 50,000 logs in every ten hours. The velocity

ling them is operated by a two-cylinder steam engine which was built by the Victoria Foundry Company, of Ottawa.

The five entrances to the power fore-bay are submerged sluices covered by a reinforced concrete apron to prevent logs from being drawn in. The apron turns the logs to the slide and is carried sufficiently low to be below the point of lowest water. The draught to the power sluices cannot therefore affect the logs



Upper section of concrete log chute.

of the logs in the 1 in 4 grade has been calculated to be $55\frac{1}{2}$ feet per second. The total length of the slide over all is 635 feet. Its piers supports number eight. The admission gate for the logs consists of nine stop-logs bolted together. They are ten feet long, twelve inches thick and twenty-four inches deep, and are lifted and lowered by a hand winch.

Everything about the structure is of the most permanent nature. When the foundation trenches were

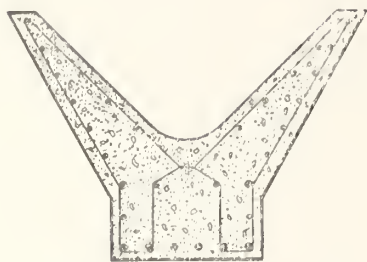


North dam at High Falls, showing outlets for overflow.

and the dam is so constructed that they are brought to the slide at all levels of the water.

The plans for the full structure were made in 1911 and the contract was let to Messrs. Haney, Quinlan and Robertson for the construction of the new dam and the completion of the log slide. Pouring concrete was started in the spring of 1912. In the whole work there are 100 tons of steel and 21,400 cubic yards of concrete. The total cost of the structure was \$250,000.

The work here described is but one of several impor-



Typical section of log chute.

tant power development structures that have been

designed by Mr. J. B. McRae, of Ottawa, the engineer for the work. One of them is the dam and power house at Ragged Rapids on the Severn River, which were built for the town of Orillia. Mr. McRae designed the dam and power house now building for the Electric Reduction Company at Buckingham, Que. He also was associated with William Kennedy, Jr., in the design and construction of the splendid dam at the Chaudiere Falls on the Ottawa River, which was undertaken for the large group of power owners of the cities of Ottawa and Hull.—Reproduced by courtesy of "The Canada Lumberman."

BRITISH PAPER INDUSTRY AND PULP TRADE

BUSINESS STILL BRISK AND A RECORD SUPPLY OF PULPS IN SEPTEMBER

FROM OUR LONDON REPRESENTATIVE

The consensus of opinion in London is that the European war may last throughout 1915. That is the prospect before Canadian and British manufacturers, and so long as the upheaval lasts, Germany, along with Austria-Hungary will be minus markets for pulp and paper. German and Austro-Hungarian mills are now practically idle, and the pulp industry will never be revived until Russia consents to the export of pulp wood from her massive and extended forests. Canada, therefore, has a bright outlook and the British market is depending on Canadians and Scandinavians for the supply of raw materials—the regulation of prices partly being in the hands of Canada's producers. That is the position today in a few sentences. The future may bring anything.

Up to the present the British paper mills have had very little to complain of, notwithstanding the wild and unfounded rumours that have been appearing in the American and other journals about a famine. There are only two elements hampering the work of British mills, one is the loss of workers through their having to join and rejoin the colors, and the second is the shortage in dyes and dyestuffs caused by German supplies being cut off. There is, of course, no actual dearth of dyes, as the English producers are doing all in their power to meet the present situation, but the prices have jumped from 60 to 100 per cent more. This element, therefore, combined with the high cost of production, is telling against producers of colored papers and wrappings, etc., with the result that the output must be restricted. Wallpaper manufacturers are the people who have suffered most and it is stated that no new patterns will be issued in 1915 and that all prices have advanced from 10 to 15 per cent. For fine grades of printing and writing papers the demand is very fair and no doubt this demand will be increased considerably as time goes on because of the absence of Germans in the markets of the various consuming countries. These markets are being rigidly watched and studied by the British Paper Makers' Association and the British Board of Trade, particularly as the tendency is during the present crisis to turn to British mills for supplies. In newsprint circles the reports are very favorable about the supply and demand. Makers are still

getting from 3 to 4 cents per lb. while others have advanced from 5 to 7 per cent. Norway is now exporting fully 300 tons of paper per day (her own daily consumption being roughly up to 30 tons per day) a good portion of which reaches England. Then there are Canadian and Newfoundland supplies, so that the British market is fairly well stocked. One drawback producers of newsprint experience is the great falling off in advertisements. In one of my recent despatches I quoted the names of several papers in London which apologised for the smallness of their sheets and pointed out that they were "conserving their paper supply." The real fact is that a great reduction in advertising compelled newspaper proprietors to reduce the size of journals and, of course, some excuse had to be presented to the public. That is what gave rise to the rumours about a "Paper Famine in England." As a matter of fact advertising people have been cutting off their own noses to spite their faces. One would imagine that with a great competitor like Germany out of the markets, advertisers would take advantage of the opportunity and show up their goods in the trade journals as well as the dailies and weeklies. But no; when Germany shut up shop they thought they must do the same. That policy of advertisers has told on newsprint producers; but now the panicky feeling is wearing off. A great many of the British papers are coming back to their old size again, and proprietors are paying more for their paper, in addition to making the discovery that the time had arrived to waken up the advertisers and show them the great opportunities that are before them. The other day I said to a very large and prominent maker of newsprint, "are you still getting the 5 per cent advance on your prices?" "Yes," he replied, "and selling plenty, and tons and tons of pulp are at my disposal for the mill." Mr. Alexander Davidson, in the course of an address to the shareholders of the Mugiemoss Paper Mill, in Scotland, said for the year they had just entered upon (that is the present period) they had advanced their prices and were getting them with little or no complaint. Prior to the outbreak of the war they had been fortunate in holding large stocks of raw material, notably wood pulp and in making considerable contracts for the latter

at the old prices a long way ahead, reaching well into next year. He hoped that the cessation of all competition from German, Austrian and other continental mills would enable them to make up for all drawbacks, such as the high cost of production, etc.

The Pulp Trade: Canada's Shipments.

The market for sulphite, sulphate, and ground wood pulps is somewhat unsettled. Importers are selling against each other and prices vary, so that it is very difficult to give accurate values. All British mills are well stocked and there is a good supply to fall back upon. Ground wood producers are begging mill owners to relieve them of their supply, but the response is next to nothing. The present situation has arisen in this way: In July mills producing wood pulp had fair stocks of the raw materials on hand and business not being plentiful, they abstained from buying, being simply contented with deliveries under existing contracts. Then in August the war broke out, and being unable to gauge what the near future might bring, there was a rush for all kinds of pulps to augment in a large degree the stocks at mills. Buying was brisk, and some good prices have had to be paid in some cases. Inquiries were also made about 1915 deliveries, and these are still going on. That is one of the reasons why the imports of pulps have jumped so much in September as the following figures show:—

September.	1913.	1914.
Chemical wood pulp	36,626	83,104
Mechanical wood pulp.	62,631	88,130
January to September.		
Chemical wood pulp	280,260	304,055
Mechanical wood pulp	414,853	423,876

These figures depict the result of the buying in August after the war broke out, and I am told that to-day there is as much ground wood and other pulps lying at Queenborough, Hull, and other ports as will last the mills a considerable time. However, the steady rate at which paper mills are now working should materially reduce supplies. The exports from Canada in September to the British consumers were as follows:—Moist ground wood, 32,027 tons, compared with 16,116 tons in September 1913, or 81,296 tons for the nine months ending September compared with 48,857 tons in 1913. Sweden more than doubled her supplies to England in September, and the same may be said of Norway as regard sulphite and ground wood moist. Since these figures have been published, a considerable quantity of pulp has arrived, the returns for the first two weeks in October the latest available being:—Ground wood pulp, 25,564 tons; chemical pulp, 127,857 tons. Of these supplies 7,584 tons of ground wood arrived from Newfoundland and 7,313 tons from Canada.

It is difficult to quote prices. Easy bleaching sulphite may be obtained from \$45 to \$48 and \$49, unbleached soda from \$46 to \$48 and strong quality at lesser values. Kraft pulp is about \$38 to \$45. The fact is that importers are selling one against the other, and I have seen so many quotations that it is difficult to say what is the fair one. Ground wood moist is down to \$10 and \$10.50.

One reason why the imports of Canadian pulp have increased is the good quality supplied. One of the largest buyers in London told me the other day that he would sooner handle Canadian mechanical and sulphite than any other produced. "We buy Canadian mechanical," he said, "because it is stronger, and the

newspaper men say that the paper made from it is excellent for the fast running machinery in the offices in London." That is the opinion of a gentleman who is highly respected in wood pulp circles and I give it for the information of Canadians, so that they may utilize their energies in trying to fulfil the requirements of the British market. "Give us Canadian pulp, but for goodness sake don't overcharge for it," is a common expression in London. Indeed, the largest cargo of pulp that has reached England for some time arrived a couple of weeks ago from Canada. It consisted of 4,000 tons of pulp from the Chicoutimi Pulp Company, of Chicoutimi.

Messrs. Lloyd, Ltd., have sustained a loss by 2,500 tons of sulphite going down in a vessel bound to Queenborough from Sweden. In Scandinavia the pulp markets are very dull. Sweden reports that British buyers are making enquiries for 1915 contracts. Esparto is easier in prices, but business owing to the reduced output of esparto papers in Scotland, is dull. There is a good demand for rags and prices are on a higher basis.

EXECUTIVE OF A. P. & P. A. ACTIVE.

(Special to Pulp and Paper Magazine.)

New York, October 25.

Much interest has been shown in the trade in the latest developments in the affairs of the American Paper and Pulp Association. The executive council met on October 16, at the offices of the organization and discussed new plans of organization, finally adopting a new constitution, which will be repeated to the members in annual convention next February for ratification.

Resolutions were passed to the effect that it is the purpose of the association to analyze cost systems scientifically and institute such systems of cost accounting in mills, as to cover all expenses entering into the actual costs of production.

The news division of the association met on October 15 and adopted a plan of organization similar to that of the other divisions. Wilson Ferguson, a man of wide association experience, was appointed permanent secretary of the division and assumed his duties at once.

MANY MEN JOIN COLORS.

The employees of Simens Brothers Dynamo Works have responded with great enthusiasm to the call to arms. A large number of men from their works and offices at Stafford, amounting in all to about 400, have already joined the Forces, and, together with the reservists and volunteers from their head office, branch offices and other departments, the total amounts to over 520. The firm is arranging to keep the posts of all these men open, and ample provision is being made for all the dependents of those who have gone to serve.

PAPER A GOOD GARMENT.

M. Gaston Darboux, the secretary of the French Science Institute, draws the attention of doctors to the value of paper under-garments as a protection against the coming winter weather. The French army in 1870 kept themselves warm by means of newspapers worn beneath their uniforms, and the Japanese soldiers on active service are even now wearing paper shirts.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

Workmen at the plant of the Northwest Paper Company, at Cloquet, Minn., are making the site ready for the construction of the new sulphite mill, which is to be erected this fall and winter. The site of the mill will be just south or down the river from the paper mill. The final plans and specifications from the architects have not yet been received, but they are expected in a few days, and the foundation work will then be started. The work under way this week consists of leveling off and removing the stone from the site of the mill.

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Paper makers are enthusiastic over news that shipments of German wood pulp and papermaking materials are en route to New York. Of the total amount of paper consumed in the United States, 25 per cent has been imported. Right now the demand is greater than the output. Fully 50 per cent of the rags have been imported for the manufacture of fine linen paper, but no rags have come in since the war started.

* * *

A contract was given on Saturday of last week by the Northern Paper Mills of Green Bay, Wis., for a Harper Fourdrinier paper machine to the Beloit Iron Works of Beloit. The bid of the Wisconsin concern was submitted by N. J. North, an officer of the company. The J. H. Horne and Sons Company of Lawrence, Mass., secured the contract for two. Work will be started at once by the Beloit Company on the construction of the machine, and parts of it will be delivered in 60 days. The eastern concern will begin work early on the beaters.

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Organization of the Crown-Willamette Paper Company, with an authorized capitalization of \$13,000,000, has just been completed by Portland, Ore., and San Francisco, Cal., capitalists for the purpose of purchasing the properties of the Crown-Columbia Paper Company, and of the Willamette Pulp and Paper Company operating plants in Washington, Oregon and California. The purpose of the organization, it is understood, is to reduce operating expenses in the paper mills by eliminating a duplication of fixed charges, thus enabling them to compete with British Columbia and Norway and Sweden, which countries have been active in the markets of the Pacific Coast since the removal of the tariff. The principal plant of the Willamette Pulp and Paper Company is at Oregon City, Ore. This mill has a daily capacity of 200 tons. The daily capacity of the various plants to be owned by the new company will be in excess of 450 tons.

According to an opinion by Judge Ray of the United States court at Utica, N.Y., the Union Bag and Paper Company, the Newton Falls Paper Company, St. Regis Paper Company, Malone Paper Company and Carthage Sulphite Company must pay damages to the American Sulphite Pulp Company, because they infringed on the Russell patent. This invention is an

acid proof cement lining in pulp digesters. The patent expired shortly after the suits were begun.

* * *

A paper exhibit, which was assembled by the Bureau of Foreign and Domestic Commerce of the U. S. Department of Commerce, was shown in Green Bay, Wis., for a week during the middle of October. The exhibit was in the rooms of the Commercial Club. Facts gathered by the bureau on the character and source of the paper supply, market requirements, home production and import trade were presented in an attractive way by the use of manuscripts. The bureau also secured names of the large users of paper, and names of persons who might become agents for American exporters, also over 100 samples were received from many consular officers by the department. The leading paper manufacturers were represented in the exhibit.

* * *

H. S. Wilder of Watertown, N.Y., who, as receiver of the Remington Paper Mills, has made them show up well financially during the past few months, is president of the new three million dollar company which will reorganize the business and take over the properties. The new company is known as the Remington Paper and Power Co. Its capital stock is \$1,575,000, and there will be refunding bond issue of \$1,500,000. Practically all the creditors of the mills—all but a few, who represent only about \$25,000 in claims—have gone into the new company, and the courts will settle with the few within a month. All three mills conducted by the Norwood Paper Co., the Remington Martin Co., the Raymondville Paper Co., will be consolidated, and operated in the future under one head. A large number of the bonds have already been subscribed for. Mr. Wilder is also president of the Diana Paper Co., president of the Harrisville Light and Power Co., and the Malone Light and Paper Co., and will have the active management of the Remington Paper and Power Co. Mr. Wilder says that the new organization means unquestioned strength to the companies, which are now in stronger and better shape than ever before. The daily output of the three mills is about 165 tons, which is said to be the fourth largest production of any one company in the United States.

* * *

That a new industry under the name of the Givan Paper Mills Co., Inc., is coming to Los Angeles, Cal., in the near future is the information received by the industrial bureau of the Chamber of Commerce of that city. This company will engage in the manufacture of various lines of paper. The company is capitalized for \$400,000. Los Angeles capital, together with eastern capital, is behind the plant. It is designed after some of the leading mills of Michigan and Ohio, and will be equipped with the most modern type of machinery. Some of the most skilled makers in the country will be employed there. It is claimed that this plant will be the largest west of Michigan.

THE QUANTITATIVE CHEMICAL ANALYSIS OF PAPER

By HENRY ALDOUS BROMLEY

In The Paper-Maker and British Paper Trade Journal

The materials entering into the composition of paper in its finished state may be classified as follows:—

1. Fibrous foundation.
2. Moisture.
3. Mineral matter.
1. Sizing materials.
5. Coloring matters.
6. Substances added for special purposes.
7. Chemical residues, etc.

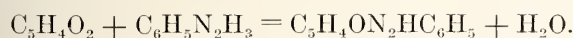
Such of the above as admit of quantitative estimation by chemical means are considered in this article.

The Fibrous Foundation.

The two fibrous materials admitting of quantitative estimation with any degree of accuracy are: (1) Esparto, and (2) mechanical wood pulp.

Determination of Esparto.—This process depends on the fact that the acid distillation of an oxy-cellulose yields furfuraldehyde in direct relation to the amount of fibre present in the paper. The determination is conducted as follows: A flask is prepared through the cork of which passes a stoppered separating funnel and having a glass outlet tube connected with a Liebig's condenser. In the flask is placed 5 gms. of the paper to be examined, cut into small pieces, and 100 c. c. of hydrochloric acid of specific gravity 1.06. The flask is then heated in such a manner that 2 c.c. of distillate per minute are delivered, a graduated measure being used for its collection. When the distillate reaches 30 to 40 c.c. it is removed to a flask, and two or three further portions collected in the same way. As each portion of the distillate is removed from the collecting measure a corresponding amount of hydrochloric acid is added to the distilling flask. The distillation is continued until a drop of the distillate ceases to give the aldehyde reaction with aniline acetate. This reaction is obtained by allowing a drop of the last portion of distillate to fall from a glass rod into a solution of aniline acetate acidified with acetic acid in a white basin. In the presence of an aldehyde a rose red coloration is produced. Failure of the distillate to give the reaction shows that the distillation is complete. The separate portions of distillate are mixed together in a beaker, and the hydrochloric acid present neutralised with a slight excess of sodium carbonate, after which a small quantity of acetic acid is added.

For the precipitation of the furfural a solution is prepared containing 12 gms. of phenylhydrazine and 7.5 gms. of glacial acetic acid in 100 c.c. distilled water. This solution is added to the distillate until a drop of the latter ceases to give the aldehyde reaction previously described. The solution is set aside for some hours with occasional stirring for the golden crystalline precipitate of furfural hydrazone formed to separate out, which it does according to the following equation:



The precipitate after being washed is filtered off through a weighed Gooch crucible. The crucible and

its contents are dried in a current of air at about 60 deg. C. and weighed. The weight of precipitate multiplied by .538 gives the weight of furfural. The average yield of furfural from 100 parts of esparto has been shown to be 12.5. The weight of esparto present in the 5 gms. of paper is therefore obtained by multiplying the weight of furfural by 8, whence the percentage weight is easily calculated.

Determination of Mechanical Wood.—Several methods have been suggested for the determination of ground wood in paper. The best known is probably that of Wurster, which depends on the depth of color produced with di-methyl-paraphenylene-diamine. Paper impregnated with this substance can be obtained, together with a scale of colors corresponding to the tints produced by various percentages of mechanical wood. The test paper is moistened and laid between a fold of the paper to be tested. In the absence of mechanical wood the paper is colored red and the tint is then compared with the standard color scale.

The method of Godeffroy and Coulon depends on the property of lignin of reducing a solution of gold chloride to metallic gold. For the estimation a weighed quantity of paper is torn into small pieces and divided into two portions of equal weight. Each portion is boiled for ten minutes in a 10 per cent solution of ammonia, washed, and dried. One portion is now burned and the ash determined. The second portion is treated by boiling with a solution of tartaric acid, followed by extraction with alcohol and ether to remove the size, and is then boiled for a further ten minutes with a 10 per cent solution of gold chloride, being afterwards washed, dried, and finally ashed. On deducting the weight of the ash obtained in the first determination from that obtained in the second, the amount of reduced gold is found. This amount is a measure of the lignone groups present and, therefore, of the amount of mechanical wood. The weight of gold multiplied by 4.7 (the average factor obtained from a number of determinations) gives the weight of mechanical wood in the amount of paper taken for analysis.

In the phloroglucin method of Cross, Bevan, and Briggs advantage is taken of the power of ligneous tissue to absorb a solution of standard phloroglucinol, the amount of absorption being directly related to the quantity of mechanical wood present. The estimation is carried out as follows:—Two gms. of the paper are pulped, dried at 100 deg. C. and weighed. The weighed pulp is transferred to a dry flask, covered with 40 c.c. of a solution made by dissolving 2.5 gms. of pure phloroglucinol in 500 c.c. of hydrochloric acid of specific gravity 1.06, shaken, and allowed to stand for some hours. The liquid is then filtered through cotton wool, placed in the neck of a funnel, and 10 c.c. of the filtrate taken for titration. This 10 c.c. is mixed with 20 c.c. of hydrochloric acid (specific gravity 1.06), heated to 70 deg. C., and titrated with a standard solution of formaldehyde made by dissolving 1 c.c. of 40 per cent "formalin" in 500 c.c. of hydrochloric acid (1.06 specific gravity). The aldehyde so-

lution is added from a burette 1 c.c. at a time with an interval of two minutes between each addition. A piece of cheap newspaper is used as an indicator, free phloroglucinol producing a red stain when a drop of the liquid is allowed to fall on the paper. Towards the end of the reaction it becomes necessary to dry the paper before a Bunsen burner before the stain will appear. Treated in this way one part of phloroglucinol in thirty thousand gives a perceptible stain. When no further color is produced the reaction is complete; 10 c.c. of the original phloroglucinol solution are now titrated in the same way, the difference between the two results giving the amount absorbed by the lignin. The proportion of mechanical wood in the paper is calculated from the following formula:—

$$H = 100 \frac{(p - 1.0)}{8 - 1.0}$$

Where H = per cent of mechanical wood.

p = absorption value of the dry ash-free sample.

8 = absorption value of mechanical wood.

1 = absorption value of sulphite wood.

Another method depends upon the action of chlorine gas on lignin. The paper under examination is rendered neutral by first boiling with a weak solution of sodium carbonate, treating with weak acetic acid, and then washing with hot water. It is then exposed in a damp condition to the action of chlorine gas, which enters into combination with lignin. After the chlorination is complete the excess of chlorine is removed, and a known quantity of water added, and the resulting hydrochloric acid determined by titration with standard soda. Each c.c. of normal soda used is said to be equivalent to .22 gm. of mechanical wood pulp.

Moisture.

In practice it is usually only necessary to make a determination of added moisture in paper. For such determination it is best to weigh a whole sheet. Dry this at 100 deg. C. in the oven, and then allow the sheet to cool while freely exposed to the atmosphere of the laboratory. The loss of weight gives the amount of moisture over and above that normally present, and is expressed as a percentage on the weight of the sheet.

Mineral Matter.

Determination of the Ash.—One gm. of paper is torn into fragments and incinerated in a weighed platinum crucible, tilted at an angle to allow free access of air. If difficulty is experienced in completely burning off the last charred particles the residue may be moistened with a few drops of ammonium nitrate and the heating continued. When the ash is almost completely white the crucible is cooled and weighed and the weight of ash determined by difference. The ash is expressed as a percentage on the weight of paper taken. Where this weight is 1 gm. the weight of ash gives the percentage figure directly, if the decimal point be moved two places to the right. Thus, .155 gm. = 15.5 per cent.

An alternative method consists in tearing the paper into three or four pieces, and impaling these on the free ends of a piece of twisted platinum wire let into a glass holder. The incineration process is thus somewhat accelerated.

Determination of the Loading and Surfacing Materials.—These may be China clay, pearl hardening, blanc fixe, talc, and satin white, either separately or

in admixture. Where any one loading is present alone its determination is practically identical with that of the ash, after correction for that normally due to the fibrous material of the paper. In the case of pearl hardening (calcium sulphate) and blanc fixe (barium sulphate) some reduction of the sulphate to sulphide takes place on ignition, and the ash requires moistening with sulphuric acid and reheating before its weight is determined. Loading materials contain more or less water which is driven off at a red heat, and this loss should be allowed for in the calculation. Thus pearl hardening normally contains two molecules of water (20 per cent) and China clay about 12 per cent.

Pearl hardening and satin white in admixture with other loadings are easily separated from them by reason of their ready solubility in dilute hydrochloric acid. For the determination of blanc fixe, talc, and China clay the residue after ignition is fused with several times its own weight of fusion mixture in a platinum crucible. By this means the bases are converted into carbonates, while the sulphates and silicates enter into combination with the sodium and potassium of the fusion mixture. The fused mass is treated with hot water for some time to dissolve out the soluble sulphates and silicates, after which the liquid is filtered and the filtrate set aside for determination of the acids. The insoluble residue, which may contain barium, aluminium, and magnesium carbonates, is dissolved in dilute hydrochloric acid and the solution reserved for determination of the bases.

The filtrate reserved for the determination of the acids as above is acidified with hydrochloric acid, evaporated to dryness, moistened with more hydrochloric acid, heated for a short time on the sand bath, and the residue taken up with hot water. This causes the separation of silica which is then filtered off, washed, dried, ignited and weighed. The filtrate from this last operation is heated to boiling, and sulphates, if present, precipitated with barium chloride in the usual way, filtered, and the precipitate washed, dried, ignited and weighed.

The solution reserved for the determination of the bases is treated with strong ammonia to precipitate alumina, which later is filtered off, washed, dried, ignited, and weighed. The filtrate from this last operation is treated with ammonium sulphate to precipitate barium, which is then ignited and weighed as barium sulphate. The final filtrate is evaporated to small bulk, half its volume of ammonia added, then excess of a solution of sodium phosphate, and any resulting precipitate estimated as magnesium pyrophosphate in the usual manner.

Sizing Materials.

Determination of Gelatine and Casein.—These bodies being nitrogenous and containing fairly constant proportions of nitrogen, their estimation resolves itself into a determination of nitrogen. The determination may be made by either of two methods, viz., by combustion with soda-lime or by Kjeldahl's process. The latter being the simpler and more generally employed process is the one described here. Kjeldahl's process depends on the fact that when most nitrogenous bodies are heated with excess of concentrated sulphuric acid their nitrogen is converted into ammonium sulphate, from which the nitrogen may be liberated by treatment with excess of alkali in a distilling. Into a special hard glass flask is introduced from 1 to 2 gms. (according to the probable proportion of gelatine present) of the paper torn into shreds, followed by about 20 c.c. of concentrated sulphuric acid (free from ni-

trous compounds) and .5 gm. red mercuric oxide. The flask is supported by the neck in an inclined position and gradually heated up to nearly the boiling point of the acid. At this stage 5 gms. of potassium sulphate are added to raise the boiling point, and the heating is continued. The liquid is at first black, but becomes lighter in color as the reaction goes on, passing through brown to yellow, and finally becoming almost colorless. The reaction usually takes several hours to complete, but once started may safely be left to itself. A crystal of copper sulphate added during the later stages will hasten completion. When the nearly colorless contents of the flask are cold they are diluted with a considerable bulk of water, and transferred to a 500 c.c. copper distilling flask, together with enough of a 50 per cent solution of caustic soda to render the liquid alkaline, 20 c.c. of a weak solution of potassium sulphide, and one or two pieces of broken clay pipe stem or pumice. A special bent delivery tube arranged to act as a condenser is used, fitted into the cork of the distilling flask, the other end dipping into a graduated measure containing a

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known volume (about 20 c.c.) of — sulphuric acid.

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The liquid in the flask is now rapidly distilled for about half an hour, by which time all the ammonia will have come over. Care must be taken so to regulate the heat that neither the liquid in the flask tends to be driven over into the delivery measure nor the acid be sucked back into the flask. The distillate is cool-

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ed and an aliquot portion titrated with — alkali, using

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methyl orange. The number of c.c. of alkali required for the whole 20 c.c. of acid deducted from 20 gives the number of c.c. of acid neutralised by the ammonia. Each c.c. of this neutralised acid corresponds to .00139 gm. of nitrogen, and the figure thus obtained multiplied by 556 and divided by the weight of paper taken gives at once the percentage of "bone dry" gelatine present. In the case of casein the factor is 490. A blank experiment using a paper free from gelatine should in all cases be done side by side with the above for the purpose of testing the reagents, etc. (even the air of the laboratory may invalidate the results by the presence of ammonia). Any neutralisation of acid obtained in the "blank" must be deducted from the figure obtained in the main experiment.

Determination of Rosin.—The difficulties in carrying out an accurate determination of rosin in paper are great. Many methods have been proposed, but most of them are more or less unreliable. The simplest is perhaps that based on the turbidity produced on diluting an alcoholic solution of rosin with a considerable bulk of water. The paper under examination is extracted with alcohol (not methylated spirits) and the extract poured into water in a tall glass cylinder. An opalescent turbidity is produced, due to the precipitation of free rosin, which turbidity is compared with that produced by an alcoholic solution containing a known weight of rosin. The results obtained by this method are very variable, since other bodies liable to be present are precipitated at the same time—notably, fatty acids from the soap often used in manufacture. The presence of more than 6 parts of rosin in 100,000 is further said to interfere with the delicacy of the reaction.

In Schumann's method the rosin is extracted by digesting with dilute alkali, precipitated with dilute sulphuric acid, filtered off, washed, dried, and weighed.

Owing to the difficulty in completely removing the alkaline resinate formed the method is unsatisfactory, giving low results. The alkali, like alcohol, also extracts other bodies besides rosin.

The following method has been recently proposed by C. F. Sammet of the Bureau of Chemistry, Washington, who claims the results to be within the experimental error of .2 per cent. Five grammes of paper are cut into strips folded and extracted in a Soxhlet with acidified alcohol (100 c.c. of 95 per cent alcohol with 15 c.c. of a 5 per cent solution of acetic acid). The solvent is allowed to siphon over from 6 to 12 times, after which the alcoholic extract is washed into a beaker, evaporated to small bulk, taken up with 25 c.c. of ether, and transferred to a separating funnel containing 150 c.c. of distilled water and a little salt to prevent emulsification. The contents of the funnel are well shaken, the water drawn off, and the process repeated. The combined ether extracts are then washed with distilled water to remove water-soluble salts, and the washed extract transferred to a platinum dish, the ether evaporated, and the residue dried in the water oven at 98 deg. to 100 deg. C. for one hour exactly, after which it is cooled and weighed. Fatty and waxy matters removed in the process are in too small proportions to affect the accuracy of the result.

Determination of Starch.—Wurster's method for the determination of starch consists in first extracting rosin by treatment of the paper with absolute alcohol, acidulated with hydrochloric acid, and then drying and weighing the paper. The latter is now boiled with a solution consisting of equal parts of alcohol and water, also acidulated with hydrochloric acid, dried, and again weighed. The difference in the weighings represents the starch present. The method is open to objection for the following reasons, viz.: firstly, the alcohol extracts matter in excess of the rosin, and, secondly, the starch is probably never completely removed by any process of simple solution.

The most satisfactory plan yet devised consists in converting the starch into soluble sugars and then determining these. Two methods are available. In the first the conversion is effected by means of malt extract or diastase, a weighed quantity of paper being first extracted with alcohol to remove rosin, dried weighed, and then treated with malt extract at a temperature of about 60 deg. C. for half an hour to an hour. The glucose and maltose formed may be estimated directly in the manner hereafter described, or the paper may be carefully washed, dried, and again weighed, and the difference in the two weighings taken as starch.

The second method depends upon the power of dilute acids to convert starch into glucose. Five grammes of paper are boiled with 500 c.c. of distilled water for 30 minutes, and then thoroughly pulped. Sulphuric acid is now added to the liquid in the proportion of 2 per cent of its weight, and the whole is heated on the water bath under a reflux condenser for three hours, or until the liquid gives no further blue color with dilute iodine solution. At the end of this time the liquid is filtered, a slight excess of caustic soda added, the filtrate made up to a litre, and 200 c.c. taken for the direct estimation of sugar which may be performed either (1) gravimetrically or (2) volumetrically. Each process is on occasion useful and both will therefore be described. In each case the reagent used is Fehling's solution, which is prepared by dissolving 34.64 gms. of pure crystallised copper sulphate in distilled water and diluting to 500 c.c., while 70 gms. of caustic soda and 180 gms. of re-crystallised

potassium sodium tartrate (Rochelle salt) are dissolved in about 100 c.c. distilled water and the solution also diluted to 500 c.c. The two solutions are mixed in equal proportions just before use. From this mixture the reducing sugars possess the power of precipitating red cuprous oxide in proportion to the amount of sugar present.

For the gravimetric estimation to 20 c.c. of Fehling's solution at the boil is added the 200 c.c. of filtrate from the acid treatment of the paper, and the whole boiled for a further ten minutes. The red precipitate formed is filtered through a Gooch crucible, washed, ignited, and rapidly weighed as cupric oxide. The weight multiplied by .4535 gives the weight of glucose in the 200 c.c. of filtrate. The amount of glucose in the whole litre of filtrate multiplied by .9 gives the weight of starch present in the 5 gms. of paper.

For the volumetric estimation, 10 c.c. of Fehling's solution diluted with water are boiled in a beaker, and while boiling the sugar solution, of the same strength as in the gravimetric process, is run in from a burette until the blue colour of the Fehling's solution is completely discharged. In practice it is not easy to determine the end point of the reaction, and it is therefore better to employ an indicator. For this purpose a drop of a solution of potassium ferrocyanide acidulated with acetic acid is placed on a white tile or spotted on a filter paper, followed by a drop of the liquid from the beaker. While any unreduced copper remains in the latter a brown precipitate—or stain—will be produced. The number of c.c. of sugar solution used is then read off and will correspond to .05 gm. of glucose since this amount is the weight of glucose capable of completely reducing 10 c.c. of Fehling's solution. The amount of starch present in the 5 gms. of paper is calculated as follows:

$$.05 \times 1000 \times .9$$

No. of c.c. of sugar sol. used

Coloring Matters.

Smalts, existing as it does in high-class papers, usually without admixture with loading materials, can be estimated with sufficient accuracy by incinerating the paper, weighing the ash, and making a correction for the small proportion of the latter due to the fibre, etc. This proportion does not usually exceed 2 per cent. The ultramarines are of variable and even doubtful composition, and are therefore best estimated by comparing the depth of color of the ash with that of standard mixtures of the pigment with known proportions of China clay. Chrome yellow, orange, etc., also of variable composition, may be determined, if necessary, by estimating the lead and chromium separately, and calculating the results to the nearest indicated composition. It is scarcely necessary here to describe the full gravimetric process as it is likely to be but rarely required. It will be sufficient to say that the lead is precipitated and estimated as the sulphate, and the chromium as chromic oxide. Prussian blue may be determined approximately by estimating the iron by igniting the paper, fusing the ash with sodium carbonate, treating the fused product with hot water, filtering, and boiling the residue with dilute hydrochloric acid and a drop or two of nitric acid. The solution is then again filtered, and the iron and alumina precipitated with ammonia in the presence of a little ammonium chloride. The precipitate of iron and aluminium hydrates is washed, filtered off, and digested with excess of caustic soda, then filtered again and

carefully washed. The residue, which consists entirely of iron, is washed, dried, ignited, and weighed as the oxide. This process also serves for the estimation of all other iron pigments except the natural colours, ochres, etc.

Substances Added for Special Purposes.

Oils and Fats can be estimated by extracting with ether, evaporating the solvent, and weighing the residue.

Paraffin Wax.—Similarly to the above using benzene or petroleum spirit.

Salicylic Acid.—This substance is used as a preservative in papers required for wrapping foodstuffs. It is extractable with petroleum ether, and may be estimated in the solution by diluting the latter with an equal volume of 95 per cent alcohol and titrating with N

—alkali using phenolphthalein as indicator. Each c.c. 10

N of — caustic soda is equivalent to .0138 gm. of salicylic acid. 10

Carbolic Acid.—The estimation of carbolic acid in carbolised wrapping paper is frequently required. Commercial carbolic acid consists chiefly of cresylic acid with higher phenols, but little real phenol being usually present. Since, however, cresol is probably as efficient as antiseptic and insecticide for ordinary purposes as phenol the absence of the latter body is of little importance. Carbolic acid may contain tar oils, which are, however, quite inert. Naphthalene is also liable to be present.

For the estimation of commercial carbolic acid the bromine absorption method in use for the determination of phenol is valueless. The writer has found the following method, which is based on a process originally described by Muter, quite satisfactory. From 10 to 20 gms. of paper (according to the probable proportion of acid present) are cut into pieces and extracted with a sufficient quantity of alcohol (95 per cent) in a Soxhlet. The extract is transferred to a basin, mixed with about half its volume of a 10 per cent solution of caustic soda, and the mixed liquids evaporated in the water bath to small bulk. Tar oils and naphthalene, if present, here separate out and may be removed by filtration. The liquid is now transferred to a separating funnel and hydrochloric acid added cautiously and with gentle shaking until the liquid shows an acid reaction. Means should be taken to prevent the mixture becoming too hot during the process. A little brine is now added. The liberated tar acids rise to the surface of the liquid which also becomes milky from the precipitation of rosin. The whole is now set on one side for a short time to complete the separation of the layer of tar acids, after which the resinous liquid is drawn off as completely as possible. The residue of oil is shaken up with ether or petroleum spirit, transferred to a weighed flask, the solvent evaporated off, and the residue weighed.

Chemical Residues and Dangerous Substances.

Bleach Residues.—Excessive quantities of chlorides are the chief indications of faulty treatment of bleach residues and of insufficient washing. For the estimation of soluble chlorides the paper is extracted with hot distilled water and the solution evaporated to small bulk. To the resulting liquid is added while stirring silver nitrate solution till no further precipitate occurs, followed by a little nitric acid. The precipitate is al-

lowed to settle, and the clear liquid is decanted through a filter. The bulk of the residue is now carefully washed several times with boiling distilled water to free it from acid, and is finally collected on the filter, and the whole dried in the water oven. The chloride is scraped from the filter, transferred to a weighed crucible, and heated at a low temperature until it commences to fuse. The filter is ashed separately on the crucible lid, and the ash treated with a drop of aqua regia, the resulting chloride being dried and added to the residue in the crucible. The weight of chloride multiplied by .248 gives the total chlorine.

Alum.—For the estimation of alum the paper is extracted with hot water, rendered slightly acid with a drop or two of sulphuric acid. The alumina is then precipitated with ammonia and estimated as described under "Loadings."

Acidity.—The total acidity of a paper is estimated by titrating a distilled water extract with — alkali, using litmus as indicator.

Soluble Sulphur Compounds are determined by extraction with distilled water and titration with iodine solution as described in "The Paper-Maker" Vol. xlviii, No. 2, page 246.

Arsenic.—An estimation of this substance is occasionally required, as where it forms the base of a coloring matter, or as in flypapers, etc. Where a relatively large quantity is available and is present as arsenious acid (as it frequently is) it may be estimated by extracting with a boiling solution of sodium bicarbonate and titrating the extract with — iodine and starch. Each c.c. of — iodine corresponds to .0049 gm. of arsenious acid.

Where minute quantities of arsenic only are present (or available) the following process is necessary: The paper is first heated for some time with a mixture of sulphuric and nitric acids in the proportion of 30 parts to 1. The carbonised residue is boiled with distilled water and filtered. An apparatus is prepared consisting of a flask provided with a stoppered funnel and having an outlet connected to a drying tube containing calcium chloride, and leading to a hard-glass tube having a piece of wire gauze wrapped round it near the middle, and heated by a Bunsen under the gauze. The arsenic extract is introduced into the flask via the stoppered funnel after 2 to 3 gms. of arsenic-free zinc and some pure hydrochloric acid have been placed in the flask. A mixture of arseniuretted hydrogen and hydrogen is evolved which is split up on reaching the heated portion of the tube and deposits a mirror of metallic arsenic in the cooler portion of the tube. This mirror is compared with those produced by solutions containing known amounts of arsenic. A "blank" experiment must always be performed in order to test the purity of the reagents.

The only son of Mr. Arthur MacFarlane, President of the United Wire Works, Ltd., is going to the front as a regular in the British army.

British Trade News

London, October 4th.

There is a greater confidence and a stronger feeling for business now prevailing in the British paper trade, and wood pulp trade. Every manufacturer is on the alert for new markets, because the German and Austrian mills are practically standing idle. In Germany alone up to 30 mills that produce kraft have had their markets suddenly cut off and, to add to their troubles, the military system of the "Fatherland" has monopolised most of the workers who are now under arms. All over the United Kingdom—and let us hope the same may be said of Canada—there is a great movement to supplant our enemy's trade, and various devices have been introduced to meet the new state of things. Advantage is being taken of the Patents, Designs, and Trade Marks Acts, under which licenses are granted to alien enemies. Messrs Bertram, Ltd., of Edinburgh, the well-known papermakers' engineers, have applied for permission to manufacture the calendering apparatus patented by Schurmann, of Dusseldorf, in 1911, and the application will be heard before the Patents Court about the 16th or 17th of October. Messrs. C. Walmsley and Co., Ltd., also papermakers' engineers of renown in Canada and England, and Messrs. Jas. Brown and Co., Ltd., Esk Mills, Penicuik, are applying for permission to utilise the process of manufacturing backings for printing illustrations, patented in 1903 by Lankes and Schwarzer.

* * *

The only fear that paper manufacturers have is the threatened shortage in colors and dyes. Aniline colors cannot be exported now to any place, or anything with the name of aniline. This is partly due to the great demand in the textile trade which is very busy night and day on military clothing. Dyes are consequently extremely expensive for paper mills, and the wall paper and paper hangings mills feel the pinch more than any other concern. In dyes and dyestuffs, of course, Germany has excelled all other countries. The Germans are able to put a tremendous amount of technical and practical information at the disposal of their customers, which has been one of the great inducements for English buyers to deal with a German chemical firm. At present no English house is hawking its goods, or needs to. Chemicals sell themselves. The fact that the Germans produce a larger selection of products, and a greater variety of shades in colors and qualities has always told in their favor. There is a great wave passing over England now over the dyes question, and everything points to a big expenditure of money in promulgating new industrial concerns. It is contended that what English color firms could do best is to concentrate in the future upon the manufacture of new colors of valuable individual qualities. Possibly this will be done.

* * *

The London newspapers have published an interview a Montreal correspondent has had with Mr. Dubuc, the managing director of the Chicoutimi Pulp Company. Mr. Dubuc says that an example of the manner in which German trade is now going to England could be furnished by himself. In the past he had sent large quantities of pulp to Germany which was made up into paper for the North American trade. This trade was now killed, all of it going to the English manufacturers. "If British manufacturers," he added, "seize the opportunities presented to them it will inevitably mean that by the end of the war an enor-

mons amount of the world trade which was formerly in the hands of the Germans will be annexed by Great Britain." Mr. Dubue's company already enjoys a splendid pulp connection in England—in fact the shipments from Chicoutimi should be a splendid example to other Canadian producers. Mr. Dubue is in a position to survey the present state of affairs, owing to his first-hand knowledge of the pulp situation in times of peace that prevails in Europe as well as in Great Britain. The Paper Makers' Association of Great Britain and Ireland and the Board of Trade are working conjointly in the movement to capture what Germany cannot supply in paper, and, incidentally, it may be pointed out that this is where a government department proves useful, its national influence and scope being in many respects invaluable for accuracy and up-to-date reports on market conditions.

* * *

Last year the Pulp and Paper Magazine published a speech, delivered in London by Lieut.-Col. the Hon. P. Pelletier, Agent-General (in London) for the Province of Quebec. I had the pleasure of listening to the speech, which was in the nature of an appeal to induce English capitalists to invest their money in the lumbering and pulp industries of Canada. Mr. Pelletier is now prominently before the public in England on the same subject and he hopes to succeed in attracting the attention of the capitalists in time. He has issued the following timely notice:—"The present time also offers rich rewards to anyone who will establish paper and pulp mills in Quebec. The existing plants are unable to fill the orders they have on hand. There is an abundant supply of cheap water power available—in fact, in some cities it is practically given away to new companies who will establish bona fide industries." Mr. Pelletier has a great admiration for the English capitalist and if he does not succeed it will not be his fault. He is constantly throwing out the warning about the "longing eye" American capitalists are throwing on Quebec pulp wood.

* * *

The 40th ordinary general meeting of the shareholders of C. Davidson and Sons, Ltd., Mugiemoss Paper Mill, near Aberdeen, in Scotland. Mr. Alexander Davidson presided. The annual report showed that the balance of profit and loss account was £541 10s 2d, which was left to the credit of that account. The directors recommended that £1,000 be written off for depreciation by transferring that amount from the special reserve fund. The report also stated that the unsatisfactory result for the year was accounted for by—(1) the excessive price of coal, amounting to an increase above ordinary years of approximately £2,200; (2) the shortage in water power through the low state of the river supplying the mill for a considerable part of the year; (3) the high cost of raw materials, freight and carriage, without a corresponding increase in the price of paper; and (4) the great scarcity of female labor, which, however, had recently been overcome. Mr. Davidson said, when dealing with the accounts for the information of the shareholders, that the sales of the mill were about one per cent less than the corresponding and about one per cent more than the year before. A shareholder pointed out that a company with a capital of something over £80,000, and an increased coal bill of something over £2,000 did not give sufficient reason, even taken along with other explanations, for non-payment of a dividend. One year it was a coal strike, another year floods on the river

Don, and another year accidents to machinery. Mr. Davidson said it was very unfortunate they were unable to pay larger dividends. There were periods when many excellent businesses have had to suspend the payment of dividends for a longer time than the Mugiemoss Mill, and afterwards they had become very prosperous.

* * *

Seeing that Canadian interest is being aroused in the Japanese market for pulp and paper, it should be stated that the British consul sent to London a report some weeks ago stating that it would not be long until Japan would be in a position to manufacture all her own paper. The paper industry was in a good condition, but, of course, high grade papers were mostly imported. It is in pulp that Japanese trade can be developed and in this respect Canada should stand out before any other nation or country. There is a shortage of pulp at present in Japan and Scandinavian exporters have received telegrams to send all they possibly can.

* * *

British papermakers are to be found in all the big battles being fought in France. When the German submarines sank the "Cressy," "Aboukir," and the "Hague," three cruisers in the North Sea, a papermaker was aboard the "Aboukir." For three and a half hours he was in the water with a lifebelt and was saved. He also succeeded in saving three comrades. The National Union of Paper Makers have done the rescuer and survivor, who by the way, is named Burrhuck, high honour and showered congratulations on him on his escape from death.

British paper mill owners are giving their old wet felts in the mills to the army for use as blankets or horse covers.

On the 5th November, the Autumnal Meeting of the British Papermakers' Association will be held in London.

LOCKWOOD'S TRADE DIRECTORY.

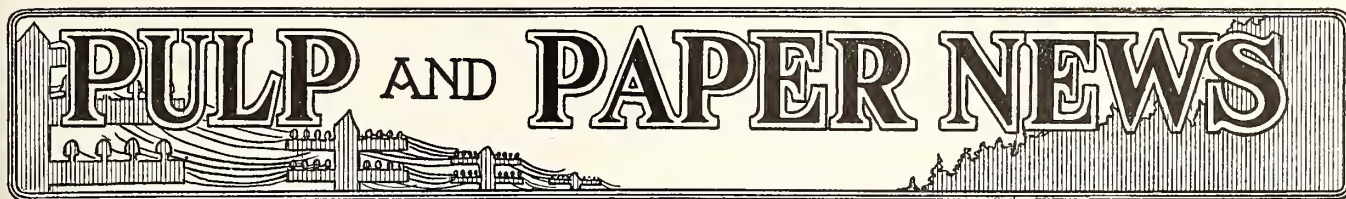
The publishers of Lockwood's Directory of the Paper, Stationery and Allied Trades of America, have favored the Pulp and Paper Magazine with a copy. The production is in every way a tribute to the enterprise and efficiency of the Lockwood Trade Journal Company, who have long been known as leaders in their own particular branch of the publishing business. This year, the publishers anticipate a welcome quite equalling that accorded the 1914 edition, not one copy of which remained unsold. The classified list of paper and pulp mill products in the United States and Canada has had the closest attention, and about one thousand new names have been added. In all other departments there has been the same careful attention to accuracy.

After all, this is the main point in a directory, and for the sake of reliability an investment in such an excellent work should return itself with high dividends in satisfaction.

Copies may be had of the Lockwood Trade Journal Company, 150 Nassau Street, New York, at \$3.00.

WANTED.—Position as officiating millwright and caretaker of paper machines, thoroughly qualified and reliable, best of references. Apply, "Unemployed, Pulp and Paper Magazine, Read Building, Montreal.

PULP AND PAPER NEWS



Donald McLean, late manager of the E. B. Eddy Company's branch at London, Ont., has removed to Toronto and entered upon his new duties, succeeding James Logie who has been manager of the Toronto branch for the past five years, but will remain with the company a few weeks yet, when, it is understood, that he will embark in the paper jobbing business. Allan M. McLean has succeeded his father as manager of the London warehouse of the Eddy Co.

John Lane, the widely known publisher of London, England, has been spending a few weeks in Montreal, Toronto and other cities, and reports that business which was at first upset by the outbreak of the war, is now back to normal in nearly all lines. National confidence in Great Britain has been restored and the publishing trade has not materially been affected. There has also been no diminution in the sale of fiction. Mr. Lane reports that he has found in Canada a growth in the requisition for English books. In the matter of gift volumes for the Christmas trade he believes there will be no falling off and, while in the past a large percentage of these books have been made in Germany, the English houses are working to full capacity to meet the orders.

The roof is now being placed on the new paper mill of the Abitibi Power and Paper Co., at Iroquois Falls, Ont., and plans have been laid for a modern town of three thousand people at this point. It is confidently expected that the industry will be turning out news print not later than June next when the output will be two hundred and thirty tons per day. Sixty thousand cords of spruce are now being used annually in the pulp mill, which is turning out about one hundred and sixty tons per day, and when the Temiskaming and Northern Ontario railway raises certain bridges along the line, the head of water at the dam will be raised six and a half feet, when the production of ground wood pulp at the plant, by reason of the operation of more grinders, will be increased about twenty-five per cent. When the paper mill is running there will be no ground wood sold, and the company will use some ninety thousand cords annually. There will be employed in the plants between six and seven hundred men besides the army in the woods.

Fred Duncan, Secretary-Treasurer of the Provincial Paper Mills Co., Toronto, has returned from spending a few days in a duck shooting expedition to Lake St. Francis on the St. Lawrence River. He has splendid luck. This is the only holiday which he ever takes.

William F. Robinson, who for many years was the representative of the Laurentide Paper Co. in Great Britain, has been appointed Manager of Sales for Price Bros. and Co., Jonquière, and has entered upon his new duties.

The new half million dollar plant of the Beaver Companies is now in operation in Thorold, Ont., making the second factory that they have built and equipped in

Canada within the last few years. The output of Beaver Board made from pure wood fibre at Thorold will be from sixty to seventy tons daily, and the plant is a model in every respect. Mr. Wright, late with the Union Bag and Paper Co., Glenn's Falls, N.Y., is the superintendent and the industry will be conducted under the name of the Beaver Wood Fibre Co., Limited, a charter having been granted during the past few days. The capital stock is one million dollars, divided into ten thousand shares of one hundred dollars each. Under the charter the company has wide powers, and may engage in practically all branches of the pulp and paper trade. The wood fibre machine is equipped with sixty dryers, and is said to be the largest of its kind in the world. It was built by Rice, Barton and Fales Machine and Iron Co., of Worcester, Mass., and extending the length of the main building of the plant, the dimensions of which are 350 x 150 feet. There is an extension to the north end of 150 feet by and to the south another addition of 150 feet x 150. The buildings are all of concrete and steel, of the factory type, with numerous windows and sky lights. The beater room, the grinding department, the motor room, the boiler house and the offices are the last word in construction and efficiency, and yet it is only a little over a year ago that the first sod was turned. The engineer in charge of the work was E.E. Whitney. The Grand Trunk has a siding running down to the plant, while the shipping facilities by both rail, and water on the Welland Canal, could not well be surpassed. The new industry is an important contribution to the town of Thorold as a pulp and paper centre, and no place in Canada has made greater progress during the past three or four years than this thriving community.

R. M. Myers, who was treasurer of the Garden City Paper Co., St. Catharines, Ont., and also treasurer of the L. H. Gardner Paper Co., of Mumford, N.Y., died suddenly in his office in Rochester, N.Y., on October 24. He was 72 years of age, and a wealthy business man, and banker. Heart failure was the cause of his death.

HOIST AND CRANE BULLETINS.

The Canadian General Electric Company has issued two most interesting booklets, No. 906, dealing with Electric Hoists designed to fill the gap between the hand chain block and the travelling crane, and No. 48,700 on Sprague Electric Monorail Cranes, respectively. Both brochures are full of information of the greatest interest to the manufacturer having loads of any kind to raise. The Monorail Crane offers many advantages such as saving in floor space, travelling at high rate of speed, avoiding of confusion, etc. The company believes that the care in design, and manufacture, combined with the thorough testing given their apparatus, that the product is as near perfection as can be obtained by human agencies.

A NEW PAPER WEIGHT GAUGER.

A paper weight gauger, for which a patent has been applied for in both the United States and Canada, is now on the market. The gauger automatically regulates the weight of paper running over the machine and also gives an automatic regulation of the pulp supply, so that a regular amount is delivered for any given weight of paper being made. This automatic weighing of the pulp takes place at the fountain head or near by to the pulp service chest. The paper weight gauger enables the paper maker to reduce to a minimum the variation in the substance of any weight of paper that he may be running and to do away with one of the greatest of complaints from customers. By virtue of this invention the paper maker is certain of the exact number of pounds per ream and the newspaper press of the world will now be assured of getting number of copies from a given weight of paper, a thing that has never been sure of in the past.

It is claimed that this attachment, when once applied to the paper-making machine, will remove many claims made by the printer on the mill owner. It also enables the machine tender to change from one substance to another, with the least possible quantity of paper made, varying say between double demy, 32 pounds which he is running, and double demy, 50 pounds when he wants to begin on. If the gauger is at once set working to the latter weight, the paper making machine will give off that substance until the order is completed. If for any reason, the machine is shut down, the pulp is shut off behind the paper weight gauger and, whenever the machine is ready to start again, all the tender has to do is to turn the pulp supply on to the paper weight gauger and the paper will be found to come automatically on the reel the same substance as before the shut-down.

This invention is most essential in the making of thin catalogue papers, which in almost every case have to meet postal regulations as to a given weight. Many a mill owner has had to meet heavy claims for overweight owing to his paper being slightly over the weight allowed for a certain postage rate per pound. The paper weight gauger or pulp regulator has been tried out in several of the largest mills in Great Britain during the past few months and in each instance has given satisfaction. As a proof of its efficiency, certain mills all ordered one and, after a thorough test installed them on their other machines.

The paper weight gauger is perfectly simple and does not entail very much alteration to the paper making machine—in fact it can be attached to any machine at the week's end.

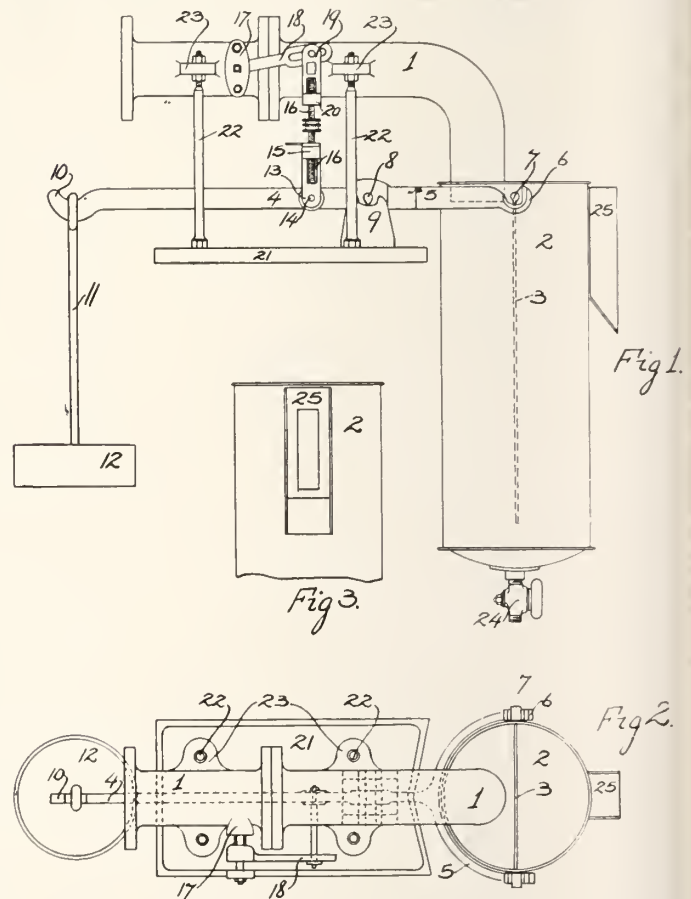
The sole rights for the manufacture and sale of the paper weight gauger are in the hands of J. L. McNicol, of Georgetown, Ont., who has had fifteen years experience as superintendent and manager of several of the largest and most up-to-date pulp and paper mills in Canada, Great Britain and India.

The object of the weight gauger, which was invented by George Drummond, of Oswaldtwistle, Lancashire, is as stated to provide a device by means of which the weight or density of the material passing from the service chest can be automatically regulated and an even, continuous flow of any required density maintained so as to insure a uniform weight throughout the paper ultimately manufactured.

With this and other objects in view, the invention consists in certain novel details of construction, and combination therefore. The invention is fully described with the aid of the accompanying drawings in which similar parts are similarly designated in all the views.

Figure 1 shows an elevation of the weight gauger; Figure 2 is a plan, and Figure 3 a detail.

1 represents a supply pipe leading into the receiving vessel 2, which is divided longitudinally throughout most of its length by a plate 3. The vessel 2 also has a vertical elongated outlet 25, tapered inwards from the mouth and a wash out cock 24 at the bottom. A beam 4 is supplied with substantially semi-circular ends 5, which encircle the sides of the vessel 2, the said ends being provided with hook shaped members 6, on which the supporting arms 7, integral with the sides of the vessel 2 rest. The beam 4 is fulcrumed on a knife edge, or other outside bearing 8 mounted on the bracket 9, which rests on the frame 21. The said frame is supported by means of rods 22 hung from flanges 23 integral with the pipe 1. On the outer end of the beam 4 and integral therewith is a hook 10 from which a weight holder 11 carrying a weight 12 is suspended.



A link 13 is pivotally mounted on the beam 4 by means of a pin 14, the said link having a sleeve 15 tapped to receive the coupling screw 16. A valve 17 is operated by a slotted arm 18, in which the link 19 is slidably mounted. The said link 19 also has a sleeve 20 tapped to receive the other end of the screw coupling 16, which is provided with right and left handed threads at its opposite ends to permit of variation in the length of the connection between the beam 4 and the allotted arm 13.

The method in which the device is operated is as follows: the amount of pulp passing through the supply pipe 1 and receiving vessel 2 into the service chest is automatically regulated by means of the weight 12 at the other end of the beam 4, and operating the valve 17 by means of links 13 and 19 and screw coupling 16. The weight 12 can be of any required size to permit of the desired quantity of pulp passing into the vessel 2 before the supply is automatically cut off by the valve 17.

Ottawa Notes

Ottawa, Ont., October 25—The grim spectre of low water still haunts the bedsides of pulp and paper manufacturers operating on the Ottawa River. Nearly every week sees some lumber or paper mill either shutting down or curtailing the extent of its activities as a result of the gradual shrinkage of supply. Fraser and Company, of Deschenes, and McLachlin Brothers, of Aruprior, on the upper part of the river, are among the latest mills to close down and it is now stated that of all the lumber and paper companies which obtain their power from the Ottawa the W. C. Edwards Company and Gilmour and Hughson are the only two large mills which are still operating at anything like capacity.

The J. R. Booth firm is now buying practically all the pulp which is necessary to keep its paper mills supplied. Last year the firm bought some pulp on account of low water but a larger supply will likely be required this season as there is little chance of operating the pulp mills and every effort is to be made to keep the paper mills in operation as long as possible.

The E. B. Eddy Company is also greatly inconvenienced. According to Mr. George H. Millen, joint manager of the concern, there is still no improvement in the situation and the water is now lower than any previous known record. The firm has already commenced to buy pulp and is procuring it mostly from Abitibi district.

Mr. Millen estimated to your correspondent that the paper mills of the company were at present operating at only about 50 per cent of capacity; the ground-wood mill at about 20 per cent while the sulphite mill is operating full blast. If it were not for the new power plant installed last year, however, it is not likely that the Eddy mills would be able to operate at all. The company considers itself very fortunate that in this year of record low water and exceptional news print opportunities, its power development enables it to some extent to meet the situation.

An order-in-council has been passed by the Government putting into effect new regulations governing the cutting of timber on school lands in Canada. The effect is considerably to increase the license fees to be charged for the timber. Hitherto the same regulations have applied to timber cut on what are known as Dominion lands and school lands. However, the timber dues on Dominion lands were purposely made low to enable the settler to obtain timber for his barns and fences cheaply whereas from the school lands, which are an endowment for educational purposes in the prairie provinces, as large a revenue as possible is desired. Under the new schedule of rates it appears that 10 per cent of its sale value will be charged for timber cut for pulpwood.

Canadian paper manufacturers who may have fancied that a recent modification of the regulations governing trading with the enemy implied that German paper products or chemicals used in the manufacture of pulp and paper might be imported into Canada if received through United States ports will be undeceived by a statement issued by the Canadian Customs Department. It is to the effect that no goods of German or Austrian manufacture will be admitted into Canada even through neutral ports. Attempts have been made by agencies in the United States of German paper manufacturers to create an impression in the minds of their Canadian customers that they

could supply them as usual. A statement also appeared in the New York Paper Trade Journal to the effect that this would be possible through recent amendments to the proclamation forbidding trade with the enemy. However, such is not by any means the case and Canadian manufacturers who find themselves inconvenienced by the lack of certain raw materials of German origin would do well to endeavor to find substitutes in Canada.

This, no doubt, will be considerably facilitated by the new regulations permitting the suspension or avoidance of German or Austrian patents held in Canada. All that is necessary is for the applicant to show that he is prepared to manufacture the patented article and that it is for the general good that he be allowed to do so. Already a number of such applications have been made and among their number will in all probability be some on the part of Canadian manufacturers who desire to supply the demand in Canada for certain raw materials for paper making of the kind mentioned.

—Mac.

TRADE INQUIRIES.

The following inquiries have been received by the Department of Trade and Commerce, on application to whom, quoting numbers, those interested may obtain full information.

1038. **Paper.**—Large Bordeaux newspaper with daily circulation one hundred and fifty thousand, willing to purchase twenty thousand dollars print paper about fifty inches long, payment conditions determined later. Quotations desired Havre or British port.

1043. **Wood Pulp.**—A Birmingham firm is open to consider quotations on sulphite.

1044. **Printing Paper.**—A Nottingham firm is open to receive quotations and samples of printing paper.

1045. **Wood Pulp.**—A London firm using thousands of tons of mechanical and sulphite pulp annually is open to receive offers c.i.f. London.

1046. **Mechanical Wood Pulp.**—A Sheffield firm is open to receive quotations.

1047. **Pulp Wood.**—A West Hartlepool firm inquires for pulp wood in quantities from 4,000 to 5,000 English fathoms of 216 cubic feet, 4-inch top and upwards, of white wood free of bark and bast.

1048. **Wood Pulp.**—A West Hartlepool firm inquires for quotations on sulphite, soda and mechanical pulps for 500 tons each of the former two, and 100 tons of the latter.

1049. **Printing Paper.**—A Nottingham firm inquires for quotations, sample on file at Department of Trade and Commerce, Ottawa.

1050. **Wood Pulp.**—A Hayfield firm inquires for sulphite wood pulp. They use about 100 tons per month. The same firm is also open to purchase mechanical wood pulp. Samples on file at Department of Trade and Commerce, Ottawa.

1059. **Wood Pulp.**—A Glossop firm would like to hear from exporters of spruce wood for paper-making purposes or sulphite pulp.

1060. **News Print.**—A Cape Town commission house with connections throughout South Africa requests immediate correspondence with a view of selling Canadian news print.

1061. **Wrapping Paper.**—A Cape Town commission house is prepared to take up a selling agency of Canadian-made wrapping paper, immediate correspondence requested.

1073. **Wood Pulp Manufacturers.**—Inquiry is made by an Italian correspondent for names of Canadian wood pulp manufacturers.



The Markets

CANADIAN MARKETS

The condition of the market in pulp and paper remains much the same as it has been for the past few weeks. There is a good demand for news print and all the mills are well employed. As the end of the year approaches there is considerable speculation regarding what prices publishers who have to renew contracts will have to pay. It is predicted that the raise will be at least ten per cent. There is not a mill which has not now all the local and foreign business that it can comfortably take care of. Book plants are fairly well employed, but the majority of them are running only five days a week. The business in other lines of paper is fair, and one commodity, which has taken a jump in price and meeting with ready requisition in Canada is kraft paper.

Several mills are troubled with low water which, owing to the absence of any heavy fall rains, is getting quite serious in Ontario, Quebec and the lower provinces. Ground wood is in steady demand and all the mills are pretty well sold up.

Speaking of the market for mechanical pulp, a leading eastern manufacturer this week said that while perhaps the number of inquiries are not as insistent as they were, still his firm were receiving communications continually for quotations and particulars regarding shipments. During the past year or two market prices of pulp have not been normal, and no doubt this had been caused in Canada by over-production, due to the construction of new mills and the over-doing of the business. With the increased consumption of news the present production of pulp should be readily consumed and future prices should be, at least, normal. It has always been said that in times of war the prices of pulp advanced, and it was probable that, as the conflict continues, the figure for ground wood and sulphite pulp would go up. The east has been troubled with low water and, as a matter of record, the water in most districts had been the lowest during 1914, for many years past, and even yet there was no indication of the usual fall rains.

Many of the lumber and pulp wood companies are going to send more men to the woods than they at first thought of doing, and the north is looking for great activity. Printing houses are getting busier, although many are still on short time. Big departmental stores and mail order concerns are sending out their usual number of catalogues, while a large number of others are issuing literature booming the "Made-in-Canada" programme.

It has been pointed out that Canadian pulp manufacturers have an opportunity to develop business with Japan as that country imported last year nearly two million dollars worth of pulp from Germany and Sweden. The supply obtained from the former country has, of course, been shut off, while the latter has been greatly curtailed. It is scarcely possible, however, that Canadian firms will make an effort to ship to Japan owing to the great distance, the heavy war risks and the increased freight charges, as all the surplus of Canadian mills will be taken care of in the United States and Great Britain. The demand for sulphite

pulp is normal, and prices are being made where contracts have expired on a monthly arrangement.

Jobbing houses are doing a good business, and report that the volume for October will be equal to that of the corresponding month of last year, although collections are rather slow. Rag and paper is quiet in most lines. A fine demand prevails for hard and soft shavings, but, in mixed papers and kindred lines, there is a lull. The prices, which ascended just after the war, have fallen. Generally speaking, there is a disposition on the part of all paper users to order only as required and let the producers carry the stock. Jobbing firms have also much less stock on hand than at this time last year, and are not disposed to load up for the future, but to proceed cautiously.

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$2.00 to \$2.10 at mill, in earload lots.
 News (sheets), \$2.10 to \$2.25 at mill, in earload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (earload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (earload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (earload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c. up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp (at mill), \$16.50 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$48, delivered in Canada.
 Sulphite (unbleached), \$48 to \$50, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.97½, f.o.b. Toronto.
 No. 1 soft white shavings, \$1.90.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.02½ to \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 35c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$6.25.

Black overall cuttings, \$1.75.
 Thirds, blues, \$1.60.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3½.
 No. 1 burlap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., ear lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, ear lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, ear lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, ear lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, ear lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, ear lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, October 25, 1914.

Inquiries for ground wood pulp flooded the local market during the interval with definite reports from paper mills, indicating that they were running very close to raw material supplies and were much in need of pulp. Manufacturers were not inclined to take advantage of the mills under the present conditions, as they were satisfied with a fair profit. There was some resentment of a market quotation of \$17.50 to \$18.00

f.o.b. ground wood mill for No. 1 pulp. Some grinders said they were unable to get more than \$12 to \$13 for their pulp. It was said that some pulp had been sold at \$12.50 f.o.b. ground wood mill. The conditions of the sale were such as to allow the purchaser to deduct for all pulp unfit for his use. This particular lot was a large pile of hemlock pulp that was made two years ago, and was not in any sense a number 1.

The sulphite situation reflected a quiet tone with some easing in prices on the arrival of large quantities for contract shipment from Sweden and Norway. The opinion prevailed that shipments of sulphite fibres would reach normal if continued over a couple of weeks at the present rate. Sulphate and kraft were in quiet demand and values rather weak.

The foreign rags market maintained a firm tone. Arrivals were spasmodic, most shipments coming from England. Advices received by certain importers indicated that German collections are very small and new packings are almost nothing.

Old waste papers have shown considerable easing under a large falling off in demand. Hard white shavings dropped about \$2.00 a ton, now being quoted at \$2.50 as against \$2.60 a few weeks ago. As some of the largest consumers of mixed papers went out of the purchasing market, stocks in warerooms quickly accumulated, and prices fell off under keen selling competition. Mixed papers are now held at 30c to 35c a hundredweight.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2¼ to 2½ delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35c delivered.
 Bleached Sulphite, impt., 2.85 to 3.25, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphate, impt., 2.05 to 2.15, ex dock New York.
 Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
 Kraft Pulp, 2.00 to 2.15 ex dock, New York.

Paper.

The general situation in American industry is reported by authoritative concerns on about a 70 per cent basis. In the paper manufacturing field a much healthier tone prevails. Reports from reliable sources show that newsprint has been operating about 85 per cent of normal. Book about 91 per cent; wrapping about 90; writing about 70; board about 70; and tissue about 90. A general average shows that paper mills have been running on about an 87 per cent of normal basis. Much speculation is offered as to the general causes of business quietness. There has been some tendency to curtail production in order to reduce mill and warehouse stocks. A canvass of jobbers showed that stocks are fairly normal, but small orders are gradually reducing these. A large part of the jobbing trade in this city is inclined to let the stocks run down rather than uphold a normal supply. Reports from the jobbing trade showed that the houses maintaining normal stocks were doing the biggest business as they were able to take care of the requests for immediate deliveries that are made by consumers. Business generally is spasmodic. The newsprint situation remained essentially unchanged. Contract consumption was fairly normal. Prices on renewals were quot-

ed at 2c to 2.10c f.o.b. paper mill. Side runs are rather scarce and prices are firm. Wrappings were in quiet demand during the interval, but values were firmly maintained. Boards reflected a slow but healthy tone. Writings were chiefly in demand in the cheaper grades. Prices are well maintained. Tissue mills reported a rather quiet period as jobbers are holding off from the high prices now asked by manufacturers.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
 Manila, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47 $\frac{1}{2}$ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

ABITIBI COMPANY MAKING PROGRESS

The Toronto Globe publishes an interesting report as to the progress being made by the Abitibi Pulp and Paper Company. It says that 1,000 men are employed and it is shipping 160 tons of pulp daily to most of the large paper makers in the United States and Canada. Two years ago the Falls here roared in a wilderness; to-day there is one of the largest industrial concerns in the Dominion of Canada in full operation. The Abitibi Pulp and Paper Company commenced to ship pulp at the end of July and has maintained a steady production ever since. The feverish demand for newsprint as a direct result of the public's demands for special editions has sent up the price two dollars a ton, and the paper makers are bidding for the consignments from the Northern Ontario mill. From the million-acre grant of the company four to five hundred men are now cutting pulp and floating it down the main rivers tributary to the Abitibi.

The timber limit is of immense extent. It runs from within a few miles of the main line of the Timiskaming and Northern Ontario Railway to the Quebec boundary, embracing nearly all of the Abitibi Lake; to the south it reaches almost to the town of Matheson, and to the north stretches far above the east and west line of the Transcontinental Railway, running

through the wilderness. Moreover, most of the pulp cut can be floated down tributary rivers and streams into the Abitibi and right up to the mill dam. The dam has been completed, and the company is now waiting until some bridges have been raised along the Timiskaming and Northern Ontario Railway before it raises the water another six and a half feet, thereby drowning out great stretches of low-lying land. This six and a half feet extra head will give the company the power necessary in order to run more grinders and raise the capacity of the plant from 160 tons of dry pulp a day to 180 or 200 tons. The tremendous consumption of spruce can be estimated when it is stated that at the present rate of consumption 60,000 cords are being used a year, and when the paper mill is running 90,000 cords. Of the finished product 230 tons will be made and shipped every day, no pulp then being made.

Allowing for all mischances, the woods of Northern Ontario should be producing paper made right in the heart of the forest in nine months. Such good progress has been made that it can now be estimated with some safety that the plant will be finished in May next. Already the company is employing a larger force of men than any other concern of any kind in Northern Ontario, apart from the Canadian Copper Company. Seven hundred men are engaged in the pulp mill and in construction on the paper mill, and there will be a permanent staff of seven hundred at least, besides the men in the woods. Foundations are being laid for a town of three thousand people.

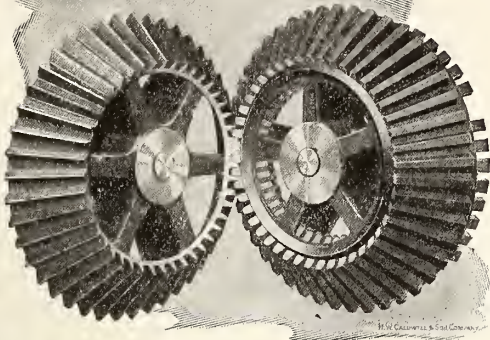
The company is going to lay the sewers and water mains before the frost seals the ground, and a Bay City real estate agent has sold all the inside lots he had to offer in the coming settlement near the railway track. The land is excellent for agricultural purposes, and almost every farm in the vicinity is being tilled, it being very obvious that the market for all produce at the Falls will be excellent. A market for pulpwood is also provided but the company itself can cut so cheaply that unless the settler is fortunate enough to be on a stream he can hardly fell it, haul it and pay the freight at the price offered by the company. Moreover the demand for pulpwood this year is so keen that the settler will probably be disposed to market it elsewhere.

MAINE ACTIVE.

Bangor, Me., October 28.—The outlook for the news print mills in the State of Maine at the present time is the brightest, and they are reaping a harvest from the increased demand for newspapers brought about by the great European conflict. The great mills of the Great Northern Paper Company at Millinocket, East Millinocket, and Madison and the mills of the other companies manufacturing news print are working at capacity to keep up with the orders.

The elimination of much of the competition from the News Brunswick mills, which are now selling their product across the water, has helped the situation here. The increased business brought about by the present situation will not stop with the close of the war, in the opinion of the Maine paper makers, who believe that Canada will continue to sell to the English market in larger quantities than heretofore.

There is every evidence of increased activity in the pulp and paper industry in Maine at present. Prices are strong and demand is good, two features that ought to make the coming year a prosperous one.



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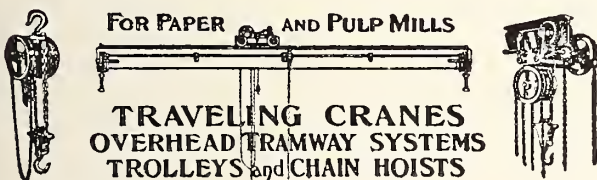
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There appears to be no fear of a prolonged industrial depression, either among the pulp and paper manufacturers of Ontario or in other lines of industry, according to F. W. Hinsdale, consulting actuary of the Workman's Compensation Board, who states that the estimates of pay rolls and number of persons employed, which is required by the Board in order to fix the assessment of the different industrial hazards, show no material difference to those of former years. In many cases there is a marked increase in the amount of the pay roll. Only in respect to building trades is there any decline indicated. In all other industries there is a feeling of optimism.

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The Warren Curtis Manufacturing Co., of Corinth, N.Y., has been incorporated with a share capital of five hundred thousand dollars to manufacture pulp and paper. Among the incorporators is Warren Curtis, Jr., manager of the Ontario Paper Co., at Thorold, Ont. Mr. Curtis states that the new company is not contemplating erecting a paper mill at present, and the concern at Corinth, which has been run under their own name, has been incorporated. Mr. Curtis will remain with the Ontario Paper Co.

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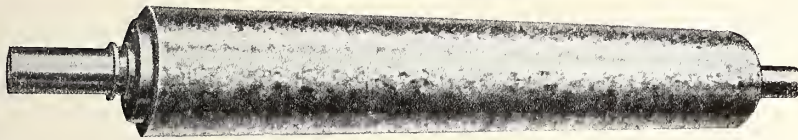
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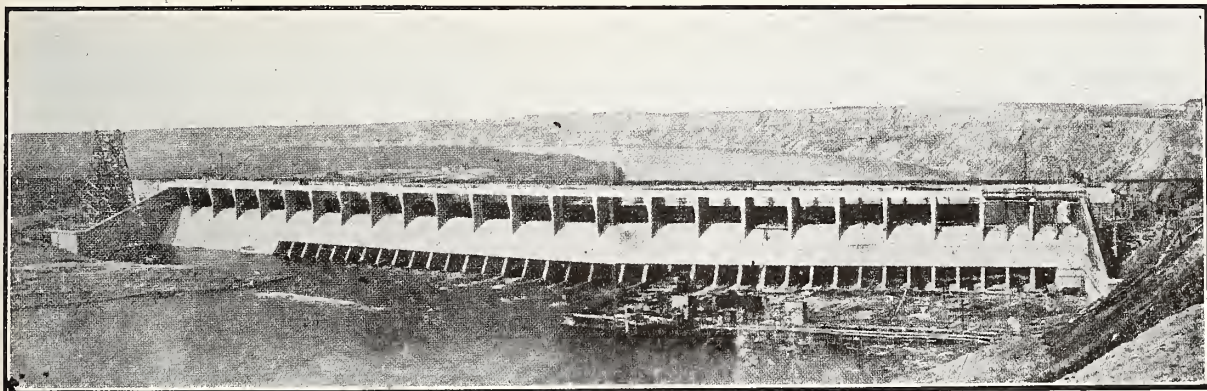
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Paper Stainers, Enamellers and Surfacers of Paper. Wholesale Stationers and Paper Merchants. Waste Paper Merchants, Rag Merchants and Paper Stock Dealers. Export Merchant Shippers of Paper. Cardboard and Paper Box Manufacturers, China Clay Merchants. Paper Bag Makers.

Sizes, Folds and Equivalent Weights of British Papers. Paper Trade Customs, etc., etc.

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This Directory is published to facilitate the work of our readers, in the mills. If the information sought is not found, an invitation is extended to communicate with the editor, who will gladly be of all assistance possible.

- Air Compressors**
Blethen, Hugh R., New York
- Air Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkes**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co. of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
- Belting**
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Reddaway, F. & Co., Montreal, Can.
- Belting "Camel Hair"**
Reddaway, F. & Co., Montreal, Can.
- Bleaching Powders**
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
- Bleaching Machinery**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Blowers**
Sherbrooke Mach. Co., Sherbrooke, Que.
- Boilers**
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Fourdrinier Wires**
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calendar Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
- Camel Hair Belting**
Reddaway, F. & Co., Montreal, Can.
- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Sllags**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticising Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Blocks**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Chain Sllags**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- China Clay**
China Clay Co., Manchester, England
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
- Chip Screens**
Bezner, Albert Machine Works, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
- Coal Handing Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Hand Power**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Wall**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Conveying Machinery**
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg. Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Pusey & Jones Company, Wilmington, Del.
Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Crushers**
Bezner, Albert Machine Works, 299 Broadway, New York City
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cutters**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kulferath, Andreas, Mariaweller, Germany.
- Cylinder Moulds**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- Dandy Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
- Digester Lining**
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Pusey & Jones Company, Wilmington, Del.
- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
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Pusey & Jones Company, Wilmington, Del.
- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Evaporators**
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que.
- Experimental Machinery**
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Engineers Ltd., Montreal, Can.
Pusey & Jones Company, Wilmington, Del.
- Exporters**
Parsons Trading Co., New York, N.Y.
- Felts**
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P. Q.
Pusey & Jones Company, Wilmington, Del.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Governors for Water Driven Grinders**
Jensen og Dahl, J. & A., 1 Broadway New York City
- Grinders**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.

MILL SUPPLIES---Continued

- Glens Falls Mach. Works, Glens Falls, N.Y.
 Hamilton, Wm., Co., Peterboro, Can.
 Jenckes Machine Co., Sherbrooke, Que.
 Pusey & Jones Company, Wilmington, Del.
 Voith, J. M. Co., Inc., New York, N.Y.
 Voith, J. M., Wurtemberg, Germany.
 Waterous Engine Works Co. Ltd., Brantford, Ont.
- Trolleys**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Hoists**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
 Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Jones, E. D. & Co., Pittsfield, Mass.
 Process Engineers, Ltd., Montreal, Canada.
- Knives**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Crookes, Roberts & Co., Sheffield, Eng.
 Hay, Peter, Knife Co., Galt, Can.
 Tippet, A. P. & Co., Montreal, Can.
- Kollergangs**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Pusey & Jones Company, Wilmington, Del.
- Laying Machines**
 Chambers, Ltd., Toronto.
 Collis & Sons, J., London, Eng.
- Motor**
 Chambers Ltd., 152 Bay Street, Toronto.
- Presses**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Can. Boomer & Boschert Press Co., Montreal, Can.
 Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
 Hough, R., London, England.
 Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Paper and Pulp Machinery**
 Beloit Iron Works, Beloit, Wis.
 Bentley & Jackson, Bury, England.
 Bertram, James & Son, Ltd., Edinburgh, Scotland.
 Bertram's, Ltd., Edinburgh, Scotland.
 Black-Clawson Co., Hamilton, Ohio.
 Canadian Boomer & Boschert Press Co., Ltd., Montreal.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto, Can.
 Dillon Machine Co., Lawrence, Mass.
 Emerson Mfg. Co., Lawrence, Mass.
 Farrel Foundry & Mach. Co., Ansonia, Conn.
 Fullner, H., Warmbrunn, Germany.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Green Bay Barker Co., Green Bay, Wis.
 Hamilton, Wm., Co., Peterboro, Can.
 Harmon Machine Co., Watertown, N.Y.
 Jenckes Machine Co., Sherbrooke, Que.
 Jensen og Dahl, J. & A., 1 Broadway, New York City.
 Jones, E. D. & Sons Co., Pittsfield, Mass.
 Johnson, C. H. & Sons, Ltd., Montreal, Can.
 Marx, J. & Co., London, E.C., England.
 Moore & White Co., Philadelphia, Pa.
 Process Engineers, Ltd., Montreal, Canada.
 Pusey-Jones Co., Wilmington, Del.
 Rice, Barton & Fales Worcester, Mass.
 Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
 Scott, Ernest & Co., Fall River, Mass.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
 Smith, S. Morgan, Co., York, Pa.
 Stebbins Eng. & Mfg. Co., Watertown, N.Y.
 Ticonderoga Machine Works, Ticonderoga, N.Y.
 Valley Iron Works, Appleton, Wis.
 Voith, J. M., New York, N.Y.
 Voith, J. M., Wurtemberg, Germany.
 Walmsley, Chas. & Co., Bury, Eng.
 Waterous Engine Works Co., Ltd., Brantford, Can.
 Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
 Chambers Ltd., 152 Bay Street, Toronto.
 Marshall, T. J. & Co., Stoke Newington, London, England
- Pneumatic Thickeners**
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Process Engineers Limited, Montreal, Can.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
 Lombard & Co., Boston, Mass.
 Stancliffe Estates Co., Ltd., Darley Dale, England
- Pumps**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Dillon Machine Co., Lawrence, Mass.
 Glen Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm., Co., Peterboro, Can.
 Lawrence Machine Co., Lawrence, Mass.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Pusey & Jones Company, Wilmington, Del.
 Smart Turner Machine Co., Hamilton, Can.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Voith, J. M., New York, N.Y.
- Recording Gauges**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Jensen og Dahl, J. & A., 1 Broadway, New York City.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Marx, J. & Co., London, E.C., England.
 Process Engineers, Ltd., Montreal, Canada.
 Pusey & Jones Company, Wilmington, Del.
 Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rosin Size**
 Fox, Stockell & Co., London, Eng.
 Paper Makers Chemical Co., Easton, Pa.
 Process Engineers, Ltd., Montreal, Canada.
 Vera Chemical Co., North Milwaukee, Wis.
 Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
 Jensen og Dahl, J. & A., 1 Broadway, New York City
- Rotary Sulphur Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Pulp Mill Machinery Co., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-Alls**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
 Bertrams Ltd., Edinburgh, Scotland.
 Bezner, Albert, 299 Broadway, New York City
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Mach. Wks., Glens Falls, N.Y.
 Harmon Machine Co., Watertown, N.Y.
 Jenckes Machine Co., Sherbrooke, Que.
 Johnson, Chas., St. Henry, Que.
 Marx & Co., J., London, England.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
 Tippet Arthur P. & Co., Montreal, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford, Can.
 Westhye, P. P., Peterboro, Can.
- Shear Legs**
 Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Cameron Machine Co., Brooklyn, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Moore & White Co., Philadelphia, Pa.
 Pusey & Jones Company, Wilmington, Del.
 Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
 Pickles, W. F., Buckland, Conn.
- Stuff Chests**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
 Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
- Sulphur**
 Union Sulphur Co., 17 Battery Place, New York, N.Y.
- Sulphur Burners**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Tachometers (Hand and Stationary)**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Track Systems**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Travelling Cranes

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurttemberg, Germany.

Water Strainers

Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B. Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatichouan Falls Paper Co., Ouatichouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B. Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merriton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

elts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

ibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wiyagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New-
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnocona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," "Hercules Manilla," "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

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Minister of Lands, Forests and Mines

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Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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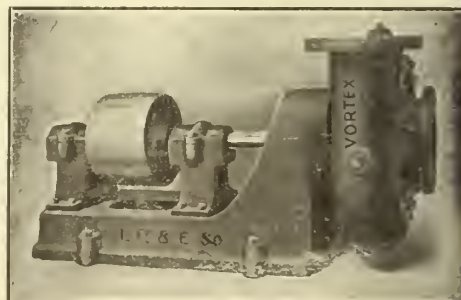
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J. A. Bothwell, Gen. Manager

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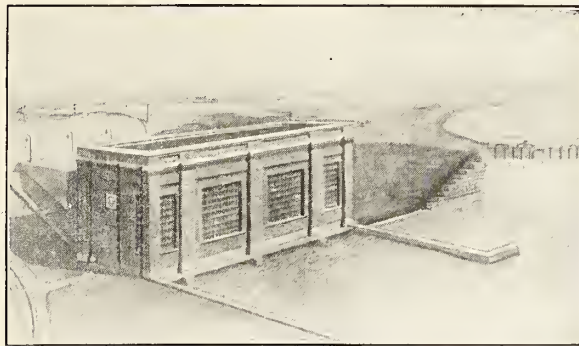
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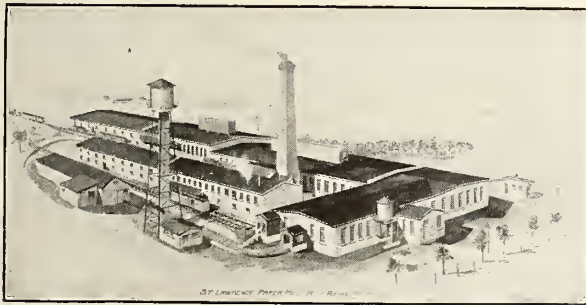
Barber Paper Mill, Georgetown, Ont.



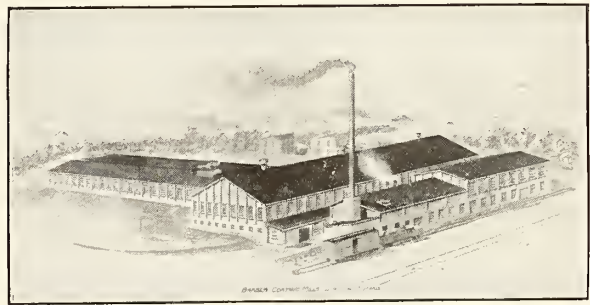
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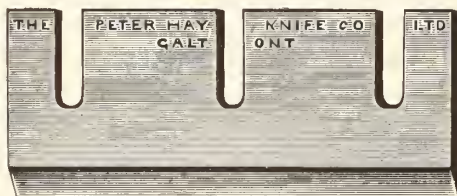
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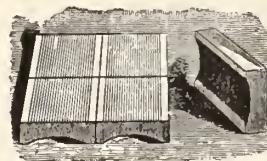


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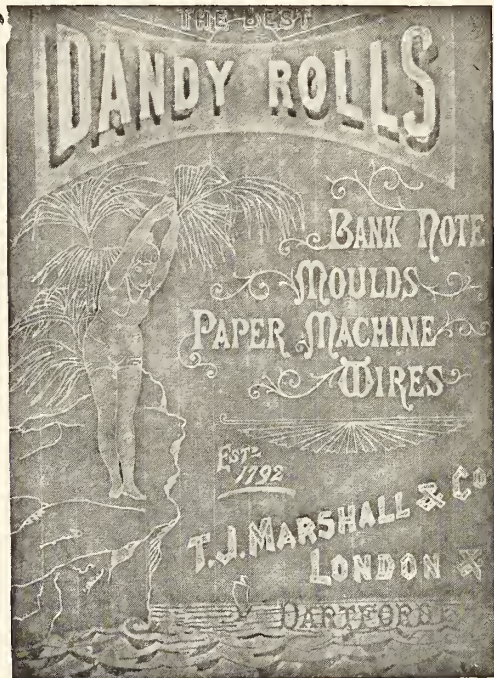
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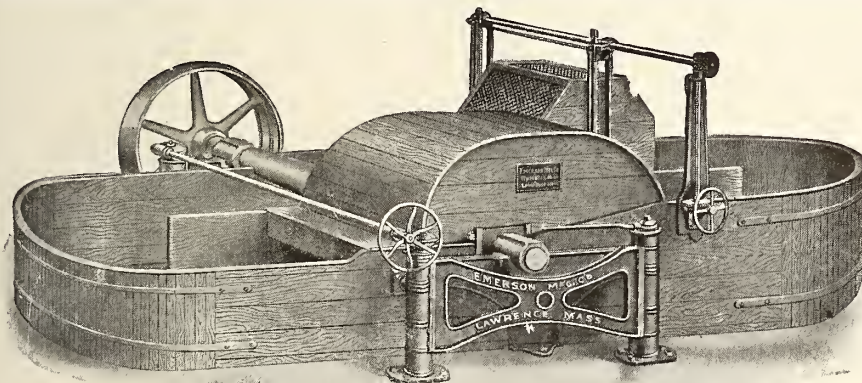
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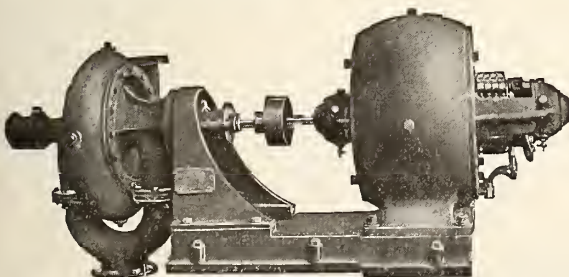
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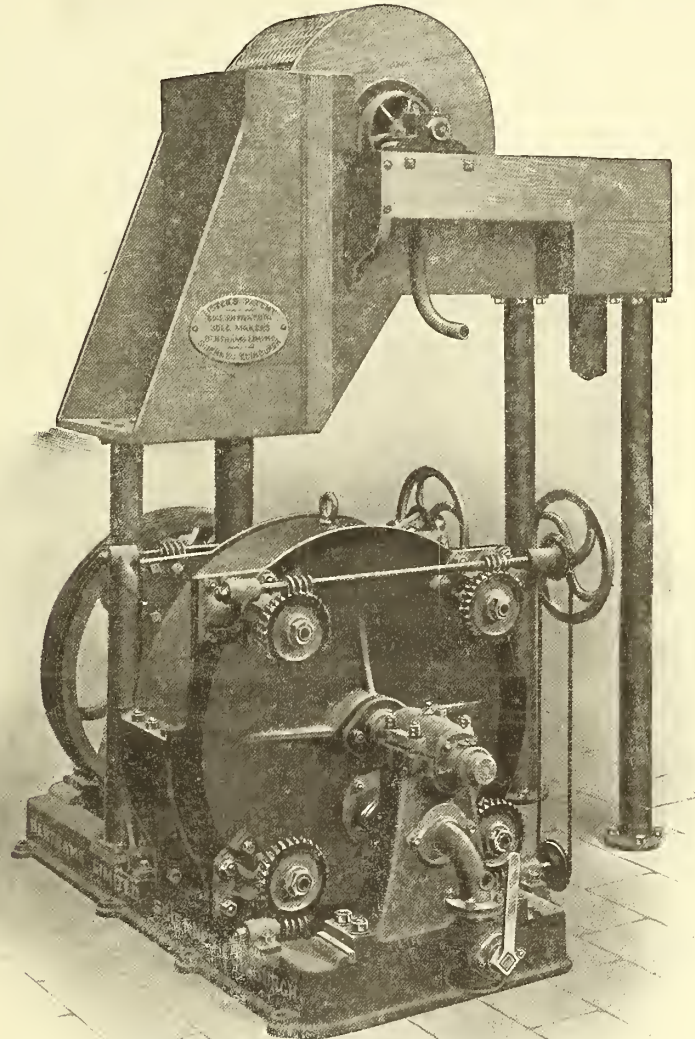
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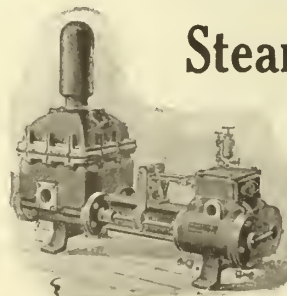
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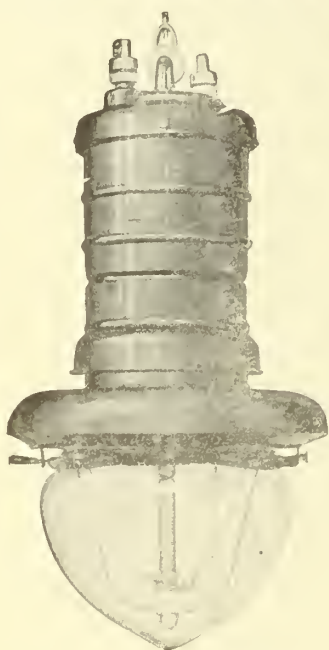
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PULP AND PAPER MAGAZINE OF CANADA

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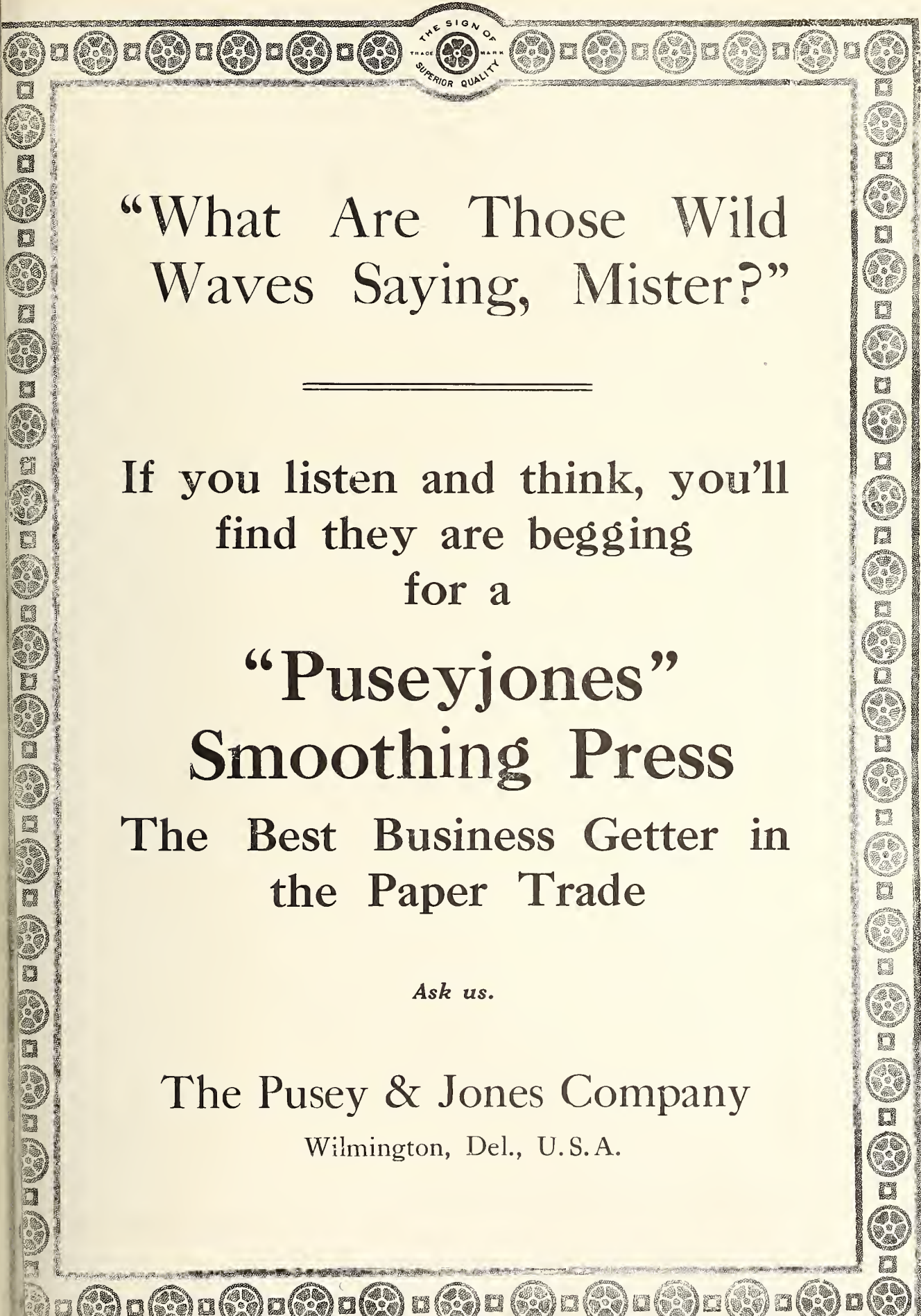
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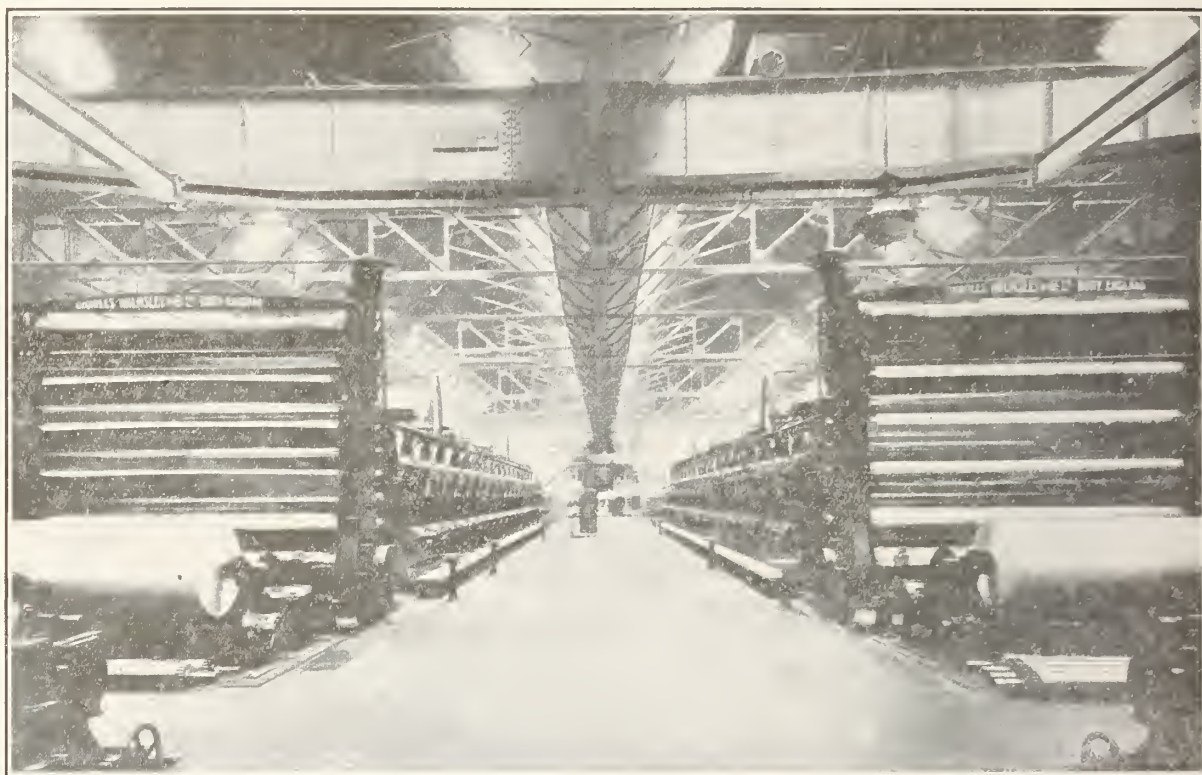
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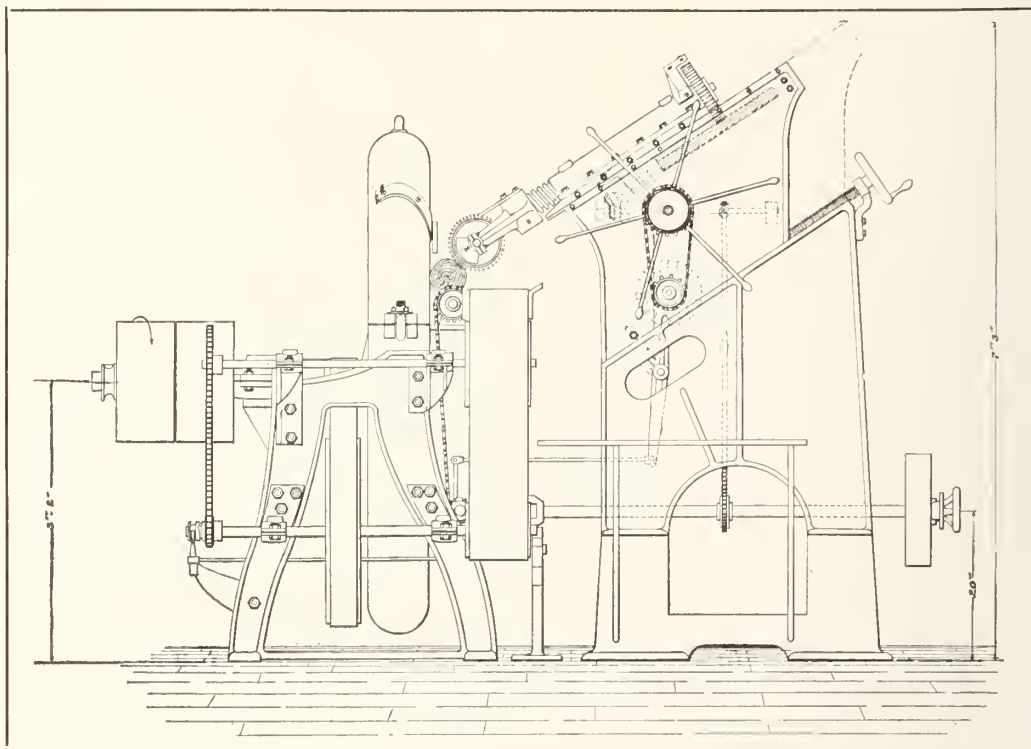
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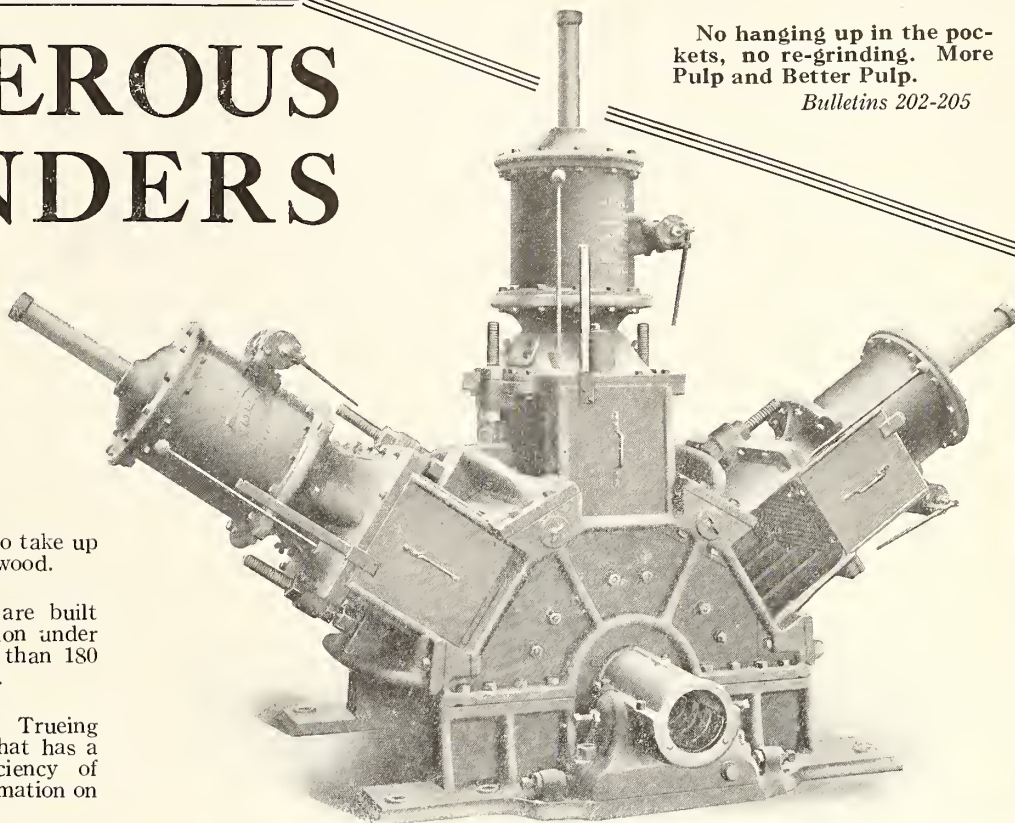
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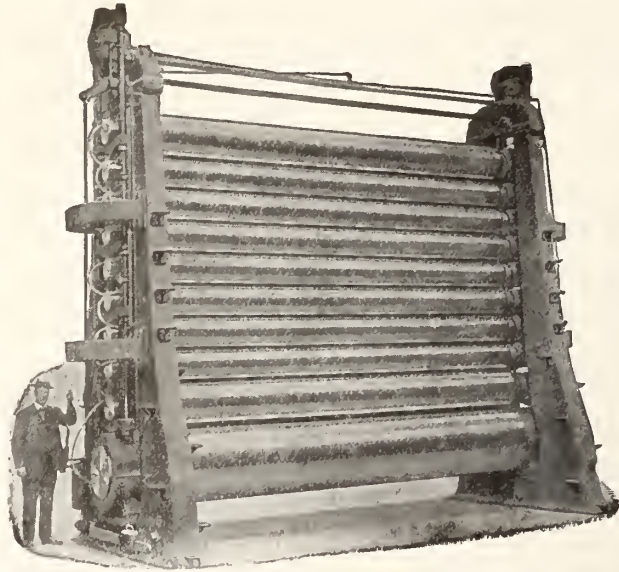
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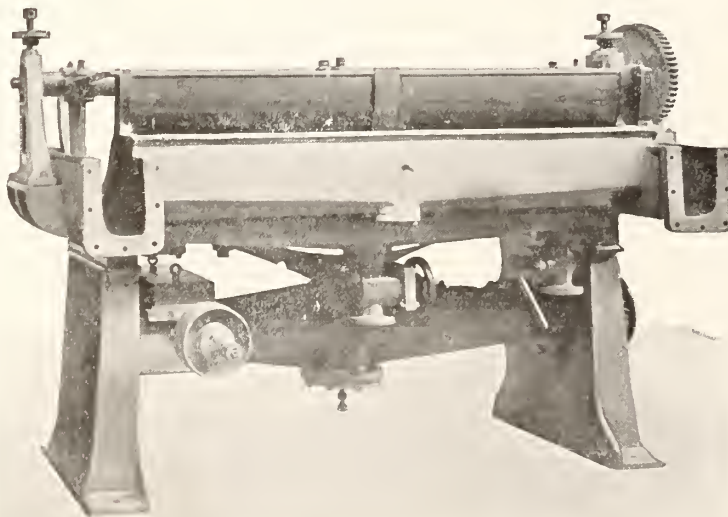
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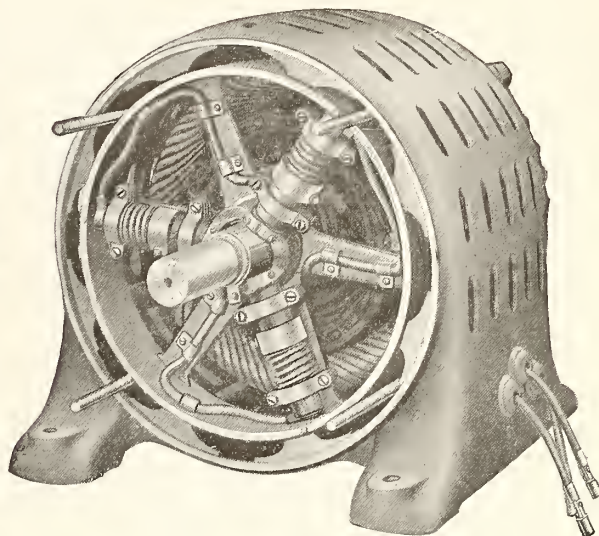
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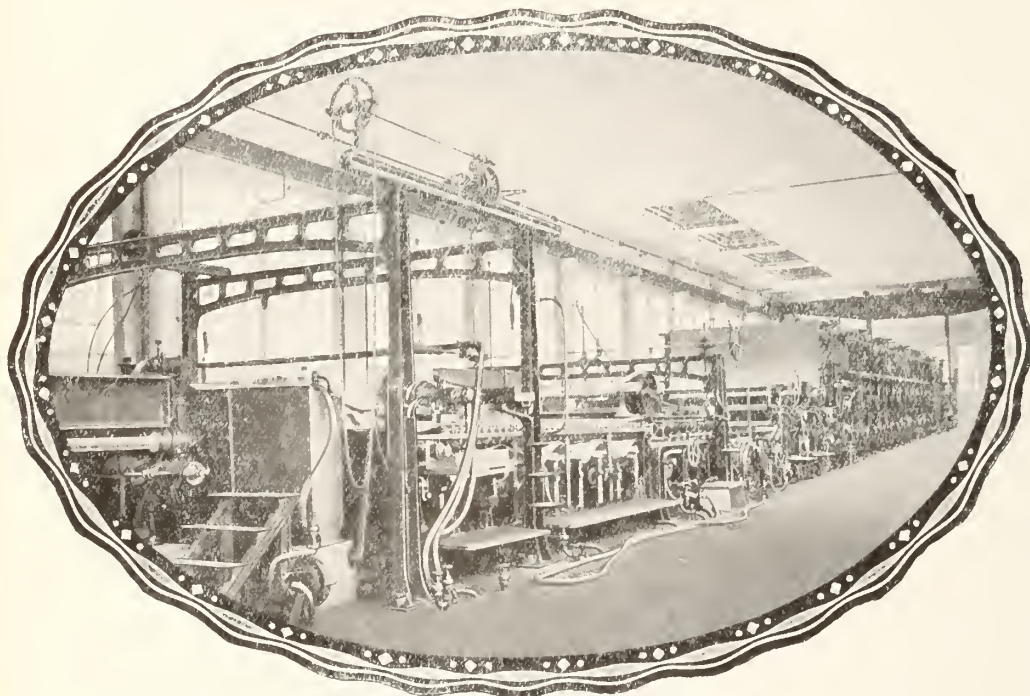
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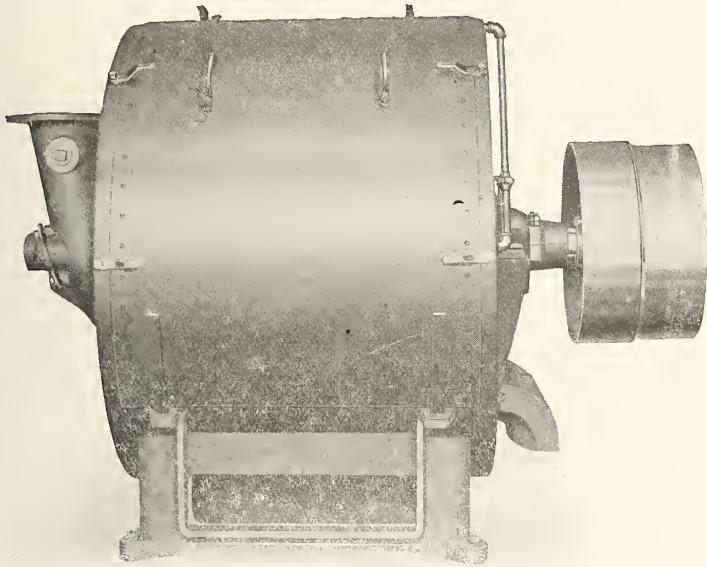
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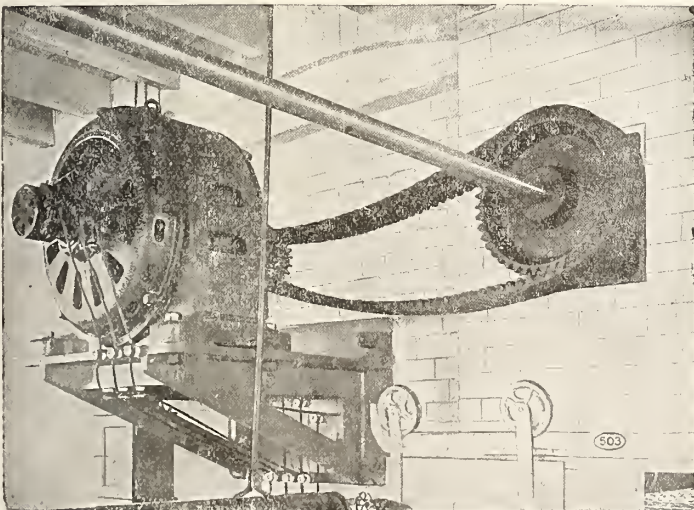
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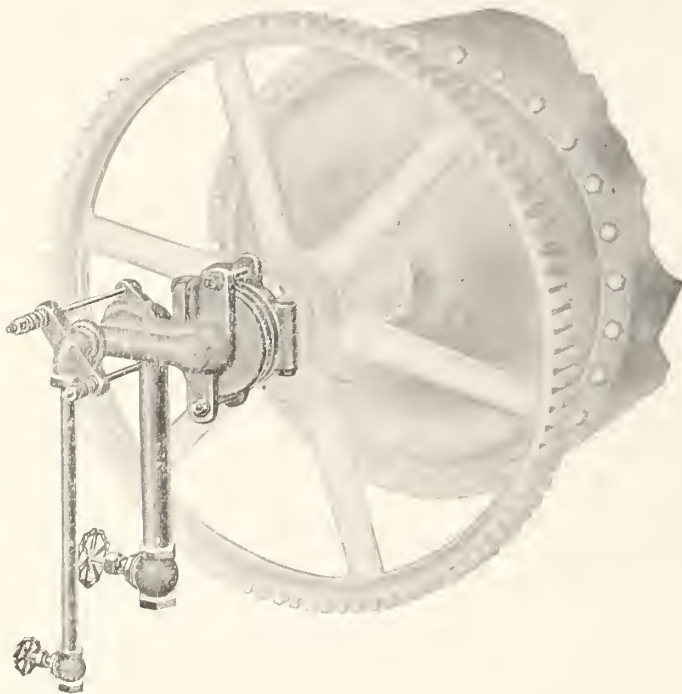
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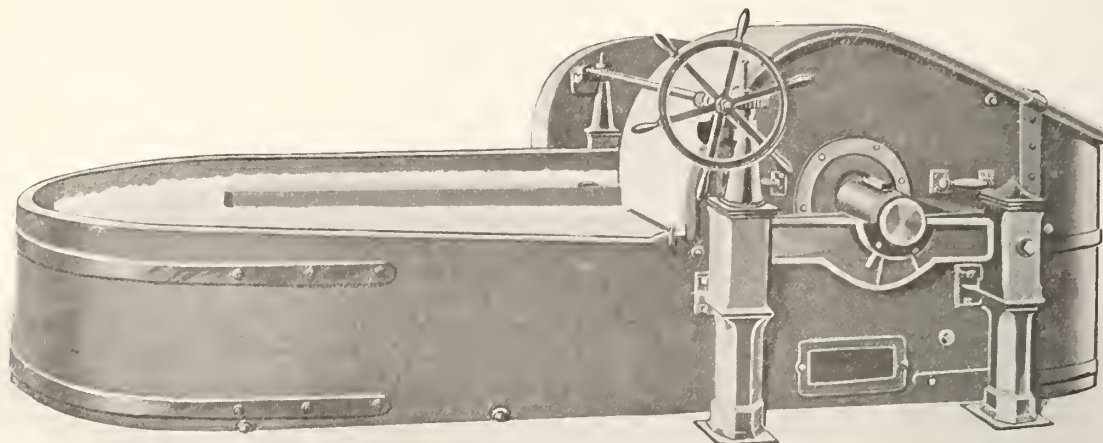
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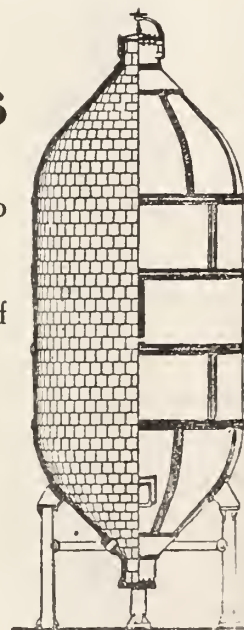
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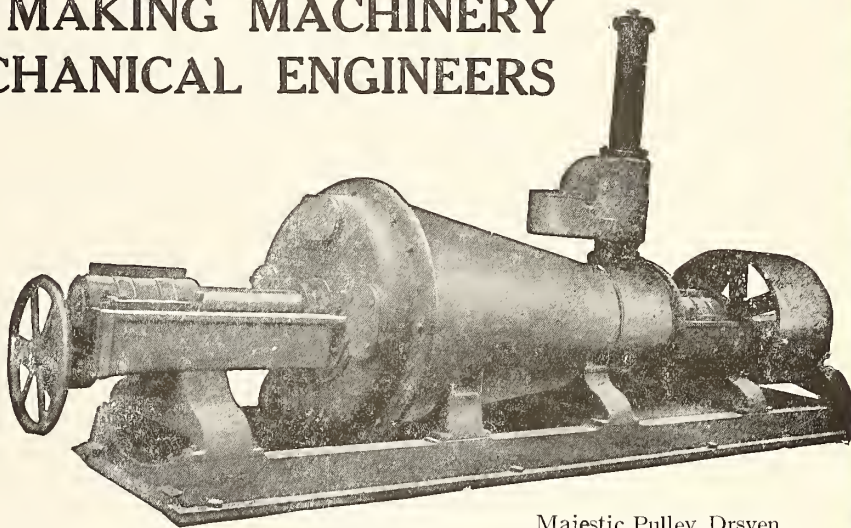
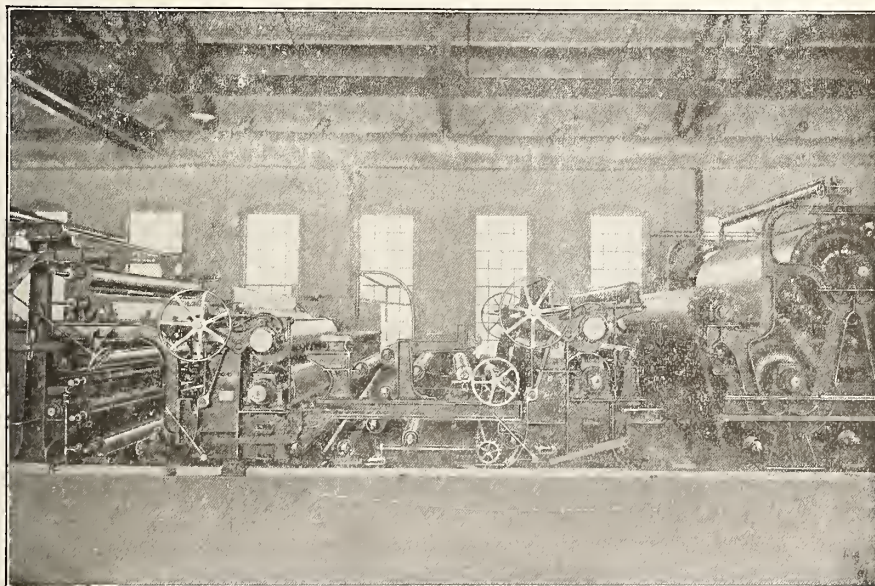
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A. G. McINTYRE, B.A., B.Sc., Contributing Editor.

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VOL. XII.

MONTREAL, NOVEMBER 15, 1914

No. 22

THRIFT.

The two main advantages to Canada that are spoken of as coming from the present conflict are that Canada will be able to replace German products with her own and that there will be a tendency back to a solid basis in finance and industry instead of wild speculation, inflation and extravagance.

The former advantage is now being discovered to a small extent. One commodity which has already displaced the German article in many markets is kraft, and it is not seriously doubted that the prosperity of Canadian manufacturers will be maintained and increased after the close of the war.

The other advantage is simply—economy. All Canadian financiers agree that the country has been borrowing too heavily and spending too freely. With the money which has been forthcoming from the mining of fertility from Western wheat fields, the bonding of questionable enterprises and the sale of real estate in the most impossible situations, Canadians have made merry. Now, say the financiers, it will be necessary for us to sober down to the stern business of paying up for our prodigality. The proceeds of wheat, cheese, minerals and manufactures which we promised to send the peasants of France, the farmers of England and others who trusted us with their hard-earned savings (through British and French capitalists) must be sent to their purchasers. Our notes which were to fall due in the bright, rosy and indefinite future are now held for payment in the immediate present. We must economize, we must encourage thrift and production in every way.

Europe lends us money largely because the people are thrifty. Millions of dollars every year come from the wool stocking and chimney corner of the careful,

saving peasant and middle class. Undisturbed by unnatural ideas of expenditures and extravagance they save money penny upon penny, pound upon pound.

We need such a spirit in Canada. Too much stress cannot be laid upon saving. A wealthy Montrealer who died recently provides an excellent example leaving the great part of his money invested in such a way that the interest should be distributed as small bank accounts to boys and girls in the schools, the object being to inculcate the saving habit.

Thrift is the watchword of the day.

In this connection it is interesting and instructive to regard an agency for thrift which has had great success in the Province of Québec, where there is legislation favorable to it. This agency is the system of co-operative people's banks, a comparatively new venture in Canadian soil but one filled with promise for the future.

As a means of conducing to prosperity in pulp mill centres the value of "la Caisse Populaire" or People's Bank can hardly be overstated. It is well known that one of the main disadvantages which any pulp or paper enterprise in this country has to face is the difficulty of holding good men in the small towns or settlements in which, on account of the distance of wood and power from densely populated centres, these mills must be established. The co-operative bank, maintained in the proper spirit, is conducive to prosperity and contentment.

To Mr. Alphonse Desjardins, of Levis, Quebec, must be given the credit for the inauguration of such a system in this country. After many years of study of national characteristics and various systems of co-operative banking he evolved the type which is acknowledged by leading banking authorities as the one most likely to succeed on the American Continent.

Honesty is the corner stone of this banking structure. A man does not need money to hold his head up among his fellows in the co-operative bank. As long as he can maintain the confidence of his fellow members for his honesty, sobriety and industry, he can borrow money from the mutual institution.

Mr. Desjardins says: "A co-operative people's bank is not an ordinary financial concern, seeking to enrich its members at the expense of the general public. Neither it is a loan company seeking to make profit at the expense of unfortunates who need loans, laboring men suffering from unemployment, agriculturists suffering from drought or floods—a company having no mercy for its victims and not hesitating to impoverish them to the extreme limit. The people's bank is nothing of the kind; it is the expression in the field of economics of a true Christian spirit and high social ideal. It is based upon the high conception, wholly just, equitable and fruitful, of "union for life" instead of "struggle for life." It does not look for big profits, although the future may have in store surprises of a very agreeable character, as has happened in Europe, where, thanks to the wise measures taken at the start, yearly dividends reach to-day proportions that no one would have dreamed of when these banks were organized.

It is open to all, provided that each is honest, industrious, sober and lives up scrupulously to his engagements. Money alone cannot entitle one to become a member. Dollars count only after honesty; they cannot replace this quality. In the joint stock company honesty is never thought of as necessary to membership because such a company is a mere aggregation of funds."

A man who is a depositor to-day, earning three per cent on his savings may be a borrower tomorrow at five per cent, and vice versa. It has been found that only small loans are asked for and that the profits of the bank as time goes on are very satisfactory, running to five per cent.

The outstanding example of the success of the bank is seen in Levis, Quebec, where in fourteen years, from an initial payment of a dime and a collection among the founders of twenty-six dollars, the assets of the bank have grown to well over \$300,000 and the loans which had been made amounted to about a million and a half. And this is among a small company of friends, just such as could be found in any paper-making centre. In Chicoutimi, Quebec, there is, indeed, a people's bank of which the secretary of the Chicoutimi Pulp Company is the manager. The members of the bank are practically all employees of the pulp company.

Honesty, sobriety, industry, thrift and prosperity are all advanced by such a bank. Pulp concerns can well afford to foster such organizations in their manufacturing centres.

IMPROVEMENT IN INDUSTRIES.

The manufacturers of Canada as well as of the United States will be greatly encouraged by the report recently issued by Duns. According to this agency "basic conditions are improving." War orders are undoubtedly flowing steadily into this continent, serving as a stimulus to every branch of industry. The recent visit to Washington of Sir George Paish, the eminent British financial authority, which resulted in greatly eased relations between British and American financial houses will do much to make business run along in the same smooth way. The cotton troubles of the South has been greatly eased by the efforts of the cotton associations in their "Buy - a - Bale" movement. The steel industry is beginning to pick up a little, lumber shows a slight improvement, textiles are busy and leather manufacturers are receiving a great impetus. Meat, horses, arms are all in demand.

All these conditions hold in Canada as well, but the fact alone that the United States promises to have a greater degree of prosperity is sufficient to give Canadian pulp and paper men much heart. Pulp is certain to be in greater demand, and with the resuming of advertising, news and book paper should see marked improvement. The same applies to the other lines, to whom the Christmas boom will mean considerable.

EDITORIAL COMMENT.

The recent Republican successes at the polls in the United States has caused some degree of satisfaction among papermakers across the line. It is felt that this is evidence of a public sentiment which will tend to sweep away the Underwood Tariff Schedule thought in some quarters to have worked hardship to the industry.

The forces of newspaperdom have of course still to be taken into consideration. This present election will and still more to the speculation which was being indulged in by all America as to the tendency of United States political life and legislation.

The Forestry Branch of the Department of the Interior will shortly have ready for distribution copies of the bulletin on Pulpwood Consumption in Canada in 1913. The information is of considerable value as showing the consumption of the various species of wood and the prices which are paid for raw material. This bulletin is only one of forty-six publications which have been issued since 1907. These deal with forest conditions in various parts of the country as surveyed by the Forestry Branch foresters, and with the forest products of the Dominion, such as timber, poles and ties, cooperage, etc. They afford, indeed, an excellent bird's eye view of our forests and the industries springing from them.

This is one of the laudable ways in which the Dominion Government is using its centralized powers to the

immense advantage of the country. These bulletins are of the highest value to those connected with forest industries, and can be read with great profit even by the layman. In these days when Canada is asserting herself as one of the powers in forest products, knowledge of the wealth and nature of the industries are more largely demanded and the efforts of the Forestry Branch are being widely appreciated. All publications are free and may be had on application.

Another effort in compilation which is a wonderful tribute to the efficiency of the recently-created Bureau of Statistics of the Quebec Government is the first annual number of the Statistical Year-Book of the Province. In it are brought together all the leading facts published by other agencies, such as the Federal Government, with the addition of a great mass of data for the first time compiled. Nothing of importance from Cabot's discoveries in 1498 to the num-

ber of beehives at present in the province has been omitted. Maps and diagrams of the very highest class add to the attractiveness of the volume of four hundred and fifty pages.

Of especial interest and value is the section dealing with the Province's wealth, written by Mr. G. C. Piche, Chief of the Quebec Forest Service and his assistant, Mr. A. Bedard. A more comprehensive study could hardly be made. Much credit is due to Mr. Piche and to the statistical bureau for their clever work.

A new system of digesting with the object in view of securing by-products such as tannic and acetic acid is described in this issue. If the inventor can operate such a plant on a commercial basis he will have taken a great step forward in the intensive utilization of wood. The point in his system that the wood itself is made to provide the disintegrating medium is most interesting. The success of this system will be viewed with close attention by the industry.

NOTES ON THE EFFICIENCY OF BEATERS

By LEO SCHLICK, M. E.

(Written Specially for Pulp and Paper Magazine.)

Mechanical pulp, chemical fibre and rags during the past century have been reduced in beaters whilst in earlier times stamps were generally employed for the purpose. The Beating Engine has been originated in Holland which led to the distinction of the "Holland Beater," with which the open tub type is characterized.

The very first machines had small solid rolls of sandstone. The tubs were also built of sandstone, or occasionally of wood, whilst the bedplate was formed by corrugated or grooved iron plates or grooved stone slabs.

Later on when the Beating Engine was introduced in the olden times paper mills, replacing the historic stamps, the rolls were made of a solid oak block, fitted with steel or bronze flybars. The size of the rolls was still small and the weight of the roll was allowed to rest fully upon the bedplate during the beating. The paper-maker then accustomed to the work with the stamps, was quite willing to wait until the rags were reduced to the pulp wanted, the weight of the roll and the actual beating surface determining the specific pressure and with same the reducing effect upon the fibre bundles.

At those times, a strong grade of paper was made regardless of time and samples, still prove that age did not do a great deal of harm to its strength.

As competition grew keener, the weight of the rolls was increased, hereby increasing the reducing effect of the beating surface, this being beneficial to the mill owners pocket but not to the entire benefit of the quality of the paper. Soon the diameter of the rolls became too large to be made from oak and therefore,

cast iron was used for the manufacture of the body, particularly for the manufacture of papers made of chemical pulp.

The method of working with the full weight of the beater roll on the bedplate, was abandoned. It was found that rolls of large diameter propelled the pulp better within the tub, and in order to make up for too heavy a roll, both bearings of the latter were placed on levers, which could be raised or lowered by means of spindles and handwheels, allowing to adjust a space between bedplate bars and flybars, just sufficient to catch the fibre bundles, and the thick fibres, whilst the fibres smaller than the adjusted space passed untreated through the beating surface. In order, to obtain a stronger paper from the same material, in recent years, counterpoising devices for the rolls have been employed with greatest success. The roll rests here fully upon the beating surface whilst the counterpoising device compensates, according to requirements, the excessive weight of the roll.

We have therefore, to make the distinction between beaters, working with an adjusted space between flybars and bedplate bars and those working with a counterpoised roll.

It is a well-known fact and is endorsed by every practical paper-maker, that a small engine gives a stronger pulp than a big one, which emphasizes my theory the more, as here the difference between actual weight of the roll wanted (to get the beating effect) and the weight of the roll, dimensioned by the manufacturer to stand the work) is smaller on small beaters than on larger engines: that is to say, smaller on rolls of small diameter than on rolls of large diameter. The diameter of the roll depends, as a rule, upon the capacity of the tub, as in the "Holland Beating Engines," the shaft ought to clear the level of the pulp.

Several years ago the writer designed a set of engines for a mill manufacturing bank note paper, and a guar-

All rights reserved. These calculations are extracts of Leo Schlick's "Paper-makers' and Mill Engineers' andbook," which is under preparation.

antee had to be given as regards actual beating surface and the respective specific pressure upon same. These rolls rested fully upon the bedplate and the pulp was beaten in the old style fashion until it actually was reduced to the pulp wanted. The proper proportioning of the actual beating surface is here of course of utmost importance. I will describe later on how the beating effect of engines should be calculated. It is evident that the expensive chemical fibres should be carefully fibrillized and be carefully split and not crushed, as done only too often.

As far as power consumption of an engine is concerned, clear distinction has to be made between unproductive power to be spent, for the circulation of the pulp in the tub and productive or absolute power spent for beating only. The unproductive power has:

(1) To overcome the friction of the pulp on the walls of the tub.

(2) To overcome the friction in the bearings.

(3) To overcome the friction of the flybars on the pulp.

(4) To accelerate the pulp from its velocity in the tub to the circumferential velocity of the roll.

For overcoming the friction of the pulp in the tub, generally a reasonable assumption must be made for, as proper tests in these respects have so far not found consideration in the design of Beating Engines although co-efficients of friction have been found for various mixtures of pulp on steel, wood and cast iron. As a rule, a certain additional incline of the bottom of the tub takes care of this, this being generally left to the discretion of the experienced beating engine designer.

The power consumed by the friction in the bearings can easily be determined and same refers to the friction between flybars and pulp, whilst the power consumed to speed up the pulp from the velocity in the tub to the circumferential velocity of the roll depends upon the velocity of the pulp in the tub, width of the roll and the circumferential velocity of the roll. Here a considerable amount may be wasted if the rolls revolve too fast, thus disabling the pulp from entering the spaces between the flybars freely. If, therefore, the capacity of an engine is to be increased it is more advisable to increase the number of bedplate bars than to speed up the roll; thus, the beating effect is increased without decreasing the pulp circulation.

The power spent for the productive work, that is to say, for the beating of the pulp, depends entirely upon the co-efficient of friction between steel and fibre, lava and fibre or bronze and fibre: whatever material the pulp maker sees fit for reducing a given quality of pulp.

It may be stated that now-a-days, the cooking of chemical pulp is enormously developed and in manufacturing a certain class of paper as a specialty, the paper maker can purchase the particular kind of pulp most suitable for his purpose. Thus for instance, a paper maker working up a hard Mitscherlich pulp will be compelled to use stone rolls for the manufacture of grease-proof, whilst when specializing in grease-proof, this grade can easily be manufactured from special grease-proof grade Mitscherlich and be beaten within two to two and a half hours with bronze bars in ordinary engines. I have done this myself.

For this reason large paper mills contracting for the supply of a special grade chemical pulp will beat out the smaller manufacturer, as far as profits are concerned as the latter's needs would not warrant to cook profitably.

So for instance, Scandinavian grease-proof makers contract for a special grade of Mitscherlich, mix in mixers and finish in especially strong and especially built Jordan Engines, being fitted with elastic pressure controlling device, and coupled to electric motors. It must, however, be understood that the Jordan Engine can never displace the beating engine, this being due to the absence of flexible beating and the thorough continuous mixing. The beating surface in a Jordan is a limited one to a certain extent. The pulp is bound to pass the beating surface within a certain limit of time, which of course, can be extended in using a sufficient number of Jordans.

The pulp in a modern high speed beating engine, however, can be beaten individually and the quality of same can be controlled during the beating process, whilst this is not possible in a Jordan. As a rule, the pulp passing into a Jordan is already loaded and sized. What I mean is, the china clay and rosin are already deposited upon the fibres before same are to be reduced to the proper size. Thus, the deposited sizing and loading materials have to be transferred from a thick fibre to the thin fibres during the beating, this not being to the benefit of the paper. For this reason, special mixers have been installed in paper mills which of course, mean a complication which easily could have been helped in using modern high speed beating engines.

A beating engine is to be considered as combination of a reducing apparatus and a mixer. It is evident that the circulation of the pulp in the tub has no other effect than to mix the pulp properly, whilst the reducing apparatus should be as efficient as possible. This means an engine should circulate the pulp under high speed, thus eliminating the settling of lumps on the sweeps and the bottom and should have an amply dimensioned roll of a large efficiency as a propeller and a beating surface of maximum possible capacity.

In order to obtain the maximum possible efficiency of a roll, the pulp should reach it with a velocity as large as possible, in order to be pressed into the spaces between the flybars. Therefore, the faster the velocity of the pulp in the tub, the less power is needed to accelerate the pulp to the circumferential velocity of the roll. This is easily to be understood if assuming for the sake of explanation the pulp entering the spaces between the flybars to have the same velocity as the circumference of the roll, which, of course, cannot be done in practice. Hereby no power would be required to accelerate the pulp. It therefore, can not be sufficiently emphasized how important it is to obtain a maximum possible speed in the tub and tests of the writer in various cases have clearly shown savings of up to 40 per cent of the power in a beater in reference to the previous output. The speed in a tub only can be obtained in converting into speed the kinetic energy, imparted to the pulp by the propelling roll. For this purpose we have to employ the hydraulic laws.

In any case, be it an inefficient beater or an efficient one, a certain amount of power has to be spent to accelerate the pulp from the velocity of the tub to the circumferential velocity of the roll. All we have to do is to convert this kinetic energy into speed. The pulp pumped up over the backfall is the bearer of a very large amount of bound energy. If one, for instance, opens the hood over the backfall, one easily can notice the effect of the enormous additional kinetic energy. The latter set free, splashes the pulp high up in the air. A proper guide, a diffusion van

only can direct the flow of the pulp and convert the useless pressure in useful speed. Here no firm rules can be given, this being left to the discretion of the experienced engine designer, who on hand of careful studies dimensions these parts accordingly.

As regards actual beating surface and its power consumption, it is to be noted that the latter depends entirely upon the specific pressure and the fibrillizing effects of the bars which I call the cutting lengths and which I will define more clearly hereafter.

As a rule, the flybars on an engine should be set in an incline to the axis of the roll, as Figure 1 shows, hereby propelling the pulp from the inside to the outside, and to facilitate the pulp to enter the spaces between the flybars.

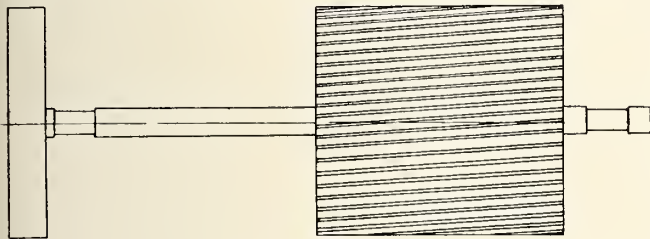


FIG. 1.

In this case, the bedplate bars are placed in parallel to the axis of the roll. This design also allows the air to escape easily from the spaces between the flybars. Very often, however, the flybars are in parallel with the axis of the roll, and the bedplate bars are set in an incline. In other cases, where a more rigorous reducing or mixing is wanted, both are done.

Calculation of the Actual Beating Surface.

If A represents the angle between two crossing bars, a the area of one crossing in square inches, Tf

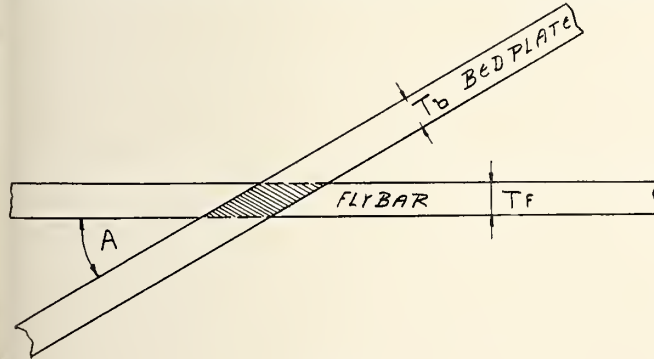


FIG. 2.

he thickness of the flybar in decimals of an inch and Tb the thickness of a bedplate bar in decimals of an inch,

$$a = \frac{Tb \times Tf}{\sin. A}$$

The beating surface is composed of a certain number of crossings of bars.

- Pr = Pitch of flybars in decimals of an inch.
- Nr = Number of flybars.
- Tf = Thickness of flybars in decimals of an inch.
- N = Number of bedplate bars.
- Tb = Thickness of bedplate bars in decimals.
- A = Angle between crossing bars.

- Ab = Angle between bedplate and axis.
- Ar = Angle between flybar and axis.
- W = Width of the roll in inches.
- Bs = Actual beating surface.

$$BS = Nb \times Tb \times W \times \frac{Tf}{Pr \times \cos A} \text{ in sq. ins.}$$

for bed plates in parallel, with the axis and flybars inclined to same.

If the flybars are in parallel with the axis of the roll the actual beating surface is

$$BS = \frac{Nb \times Tb}{\cos A} \times W \times \frac{Tf}{Pr} \text{ in sq. ins.}$$

If both flybars and bedplates are inclined, the actual beating surface is found in using the formula

$$BS = \frac{Nb \times Tb}{\cos Ab} \times \frac{Nr \times Tf}{\cos Ar} \times \frac{W}{\text{dia.} \times \Pi}$$

A fair approximate result is obtained in using the formula

$$BS = Nr \times Tf \times Nb \times Tb \times \frac{W}{\text{dia.} \times \Pi}$$

EXAMPLE:

- Roll dia. = 72 ins.
- Width = 60 ins.
- Number of flybars = 87
- Thickness of flybars = 0.375 ins.
- Complete weight of roll plus shaft = 16,000 lbs.
- Angle between axis of roll and bedplates Ar = 4 deg.

$$\text{Flybar pitch } Pr = \frac{72 \times 3.14}{87} = 2.6 \text{ ins.}$$

- Number of bedplate bars Nb = 40
- Thickness of bedplate bars Tb = 0.25 ins.
- Flybars bars to be in parallel with the axis of the rolls, and bedplates to be inclined.

$$\begin{aligned} BS &= \frac{Nb \times Tb}{\cos A} \times W \times \frac{Tf}{Pr} \\ &= \frac{40 \times 0.25}{1} \times 60 \times \frac{0.375}{2.6} \\ &= 10 \times 60 \times 0.144 \\ &= 86.4 \text{ square inches.} \end{aligned}$$

The maximum possible specific pressure upon the actual beating surface is then—

$$\frac{\text{Weight of roll } 16000}{BS \quad 86.4} = 185 \text{ lbs sq. in. specific pressure}$$

The proportioning of actual beating surface influences the capacity of the engine considerably, whilst the specific pressure upon the beating surface is based upon experience.

Several years ago the writer investigated a beater plant where the completely new and generally well built engines needed fully 6½ hours to reduce Mitscherlich to writing pulp. A careful investigation showed a wrongly proportioned beating surface, after changement of which a high grade stock was beaten within 2½ hours.

Cutting Length.

When a roll fitted with flybars being parallel to the axis is revolving, every one of its flybars will come in touch with every one of the bedplate bars and in the above fig. No. 3 mentioned "Intersection" will

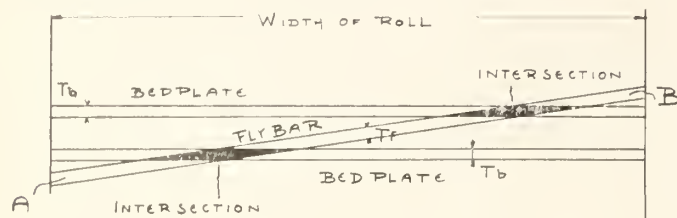


FIG 3

move from right to left (see Fig. No. 3): that is from B to A. I call the distance travelled by this intersection the "cutting length."

The cutting lengths of a beating engine are to be figured as per the formula—

$$L = Nb \times W \times Nr \frac{\text{R.P.M.}}{60} \text{ in ins. per sec.}$$

The cutting lengths of the above example would be—

$$L = 40 \times 60 \times 87 \times \frac{90}{60} \text{ in inches per second.}$$

$$= 313.200 \text{ inches per second.}$$

Supposing the tub of the engine has a capacity of 1800 lbs. at 7 per cent dry, then the cutting lengths per 100 lbs. of pulp at a basis of 7 per cent dry would be—

$$L = \frac{313.200}{18} = 17400 \text{ inches per second.}$$

The larger the cutting lengths in an engine, the larger the beating capacity, the shorter the beating time. As a rule, the paper manufacturer will make papers of similar character on a certain machine, and he should use engines having sufficiently heavy rolls to allow for a maximum possible dimensioning of the bedplate.

The thickness of the bars has to be taken in accordance with the quality of the pulp to be beaten; thus a thin flybar having cutting edges of $\frac{1}{4}$ in. to $\frac{5}{16}$ in. will beat free pulp if working under an economic specific pressure, bars of $\frac{5}{16}$ in. to $\frac{3}{8}$ in. thickness will be good for the average requirements, whilst a still thicker flybar gives a more smeary pulp, all the above subject to a proper specific pressure.

Owing to the getting blunt, that is to say round of the edges of the steel bars, the same specific pressure cannot be maintained all the time: thus two engines of the same make differ somewhat as regards capacity when comparing the same phases of the beating.

Generally the beater man hears how the engine is beating and a glance at the surface of the pulp is sufficient to tell him how far the beating has proceeded. He can control the time in which the pulp is to be beaten, but not the actual specific pressure upon the beating surface. This led to devise the counterpoising of the roll. In engines equipped with this device the rolls are strong and heavy whilst a plate weighted lever system allows the beater man to control exactly the pressure upon the beating surface, on

which the reduced weight of the roll is resting.

If charging such engines with pulp the rolls will jump up a little only and then not damage anything as the roll and the counterpoising device absorb a considerable amount of shock owing to their masses. We have a similar example in motor cars. A heavy car will go smoothly over a road where a light car will jerk.

Productive Power Consumption.

This refers to the actual beating only.

$$\text{H.P.} = \frac{BS \times Q \times U \times V}{550}$$

BS = Actual beating surface in square inches.

Q = Pressure per square inch upon actual beating surface (specific pressure).

U = Co-efficient of friction.

V = circumferential velocity of roll in feet per second.

EXAMPLE:

Roll dia. 72 ins.

Roll width, 60 ins.

Roll weight 16000 lbs., including pulley, shaft and proportion of weight of the levers on which bearings are mounted.

BS = 86.4 square inches.

Q = 110 lbs. per square inch active spec. pressure.

U = 0.065.

V = 28 feet per second.

The power consumption of the engine figures then as follows:—

$$= \frac{86.4 \times 110 \times 0.065 \times 28}{550} = 31.6$$

That is to say, the beating engine consumes 31.6 brake horse-power on the beating surface not figuring the acceleration, bearing friction and flybar friction.

Power Consumption for Accelerating the Pulp.

This forms a very important item. The power consumption here is:—

$$\text{H.P.} = \frac{M \times \frac{62.5}{32} = (V - V_p) \times V}{550}$$

If = lbs. of pulp to be accelerated per second.

V = Circumferential velocity of the roll in feet per second.

Vp = Velocity of the pulp in the tub in feet per second.

EXAMPLE A.

The average velocity of the pulp in the tub is found to be 50 feet per minute. The area of a cross section of the flowing pulp is measured to be 16.5 square feet. The quantity of pulp in cubic feet accelerated by the roll per second is, therefore

$$\frac{16.5 \times 50}{60} = 13.75.$$

The weight of pulp to be accelerated per second is therefore, $13.75 \times 50 = 687.5$ lbs.

The circumferential velocity of the roll is 28 feet per second. Therefore the power consumption to accelerate the pulp—

$$\text{H.P.} = \frac{62.5 \times 687.5 \times 32 \times (28 - 0.83) \times 28}{550} = 18.5$$

which amounts to—

$$\frac{18.5}{687.5} \times 100 = 2.7 \text{ H.P. per 100 lbs. of dry pulp, circulating in the tub.}$$

EXAMPLE B.

The same engine as the above circulating the pulp with 25 feet per minute only, has a quantity of pulp to be accelerated per second of

$$\frac{17.5 \times 25}{60} = 7.3 \text{ cub. ft.}$$

equals to $7.3 \times 50 = 365$ lbs. of pulp per second and requires—

$$\text{H.P.} = \frac{62.5 \times 365 \times 32 \times (28 - 0.42) \times 28}{550} = 10$$

which amounts to—

$$\frac{10}{365} \times 100 = 2.73 \text{ brake horsepower per 100 lbs. of dry pulp circulating in the tub.}$$

whilst in both cases as evident the amount of power consumed to accelerate 100 lbs. of dry pulp is the same, in example A as much as 687.5 lbs. per second are passing the beating surface, whilst in example B as much as 365 lbs. have got the chance to be beaten only.

The beating time is, therefore, in proportion to the pulp passing over the actual beating surface: that is to say, an engine with 50 feet of pulp speed per second will have 1.87 the capacity than the engine of 25 feet of pulp speed per second.

Assuming the beating time for a certain pulp in the engine with 25 feet per minute is 2 hours, then the beating time of the engine with 50 feet circulating velocity is—

$$\frac{2}{1.87} = 1.07 \text{ hours.}$$

The proper gauge for the capacity of a beating engine is the amount of pulp turned out by one horsepower per hour.

EXAMPLE:

Beater A.—Capacity 1800 lbs., actual beating surface 86.5 square inches.

Specific working pressure 110 lbs. per sq. in.

Circumferential velocity of roll = 28 feet per second.

Pulp speed per minute, 50 feet.

Beating time, 1.07 hours.

Power consumption, 50 brake horse-power.

Charge 1800 lbs. dry.

$$\text{Capacity per hour} = \frac{1800}{1.07} = 1682 \text{ lbs. of pulp (dry)}$$

$$\text{One H.P. per hour beats} = \frac{1682}{50} = 33.6 \text{ lbs.}$$

Beater B.—Capacity 1800 lbs. actual beating surface 86.5 sq. ins.

Specific working pressure 110 lbs. per sq. in.

Circumferential velocity of roll = 28 feet per second.

Pulp speed per minute 25 feet.

Beating time 2 hours.

Power consumption 41.6 B.H.P.

Charge 1800 lbs. dry.

$$\text{Capacity per hour} = \frac{1800}{2} = 900 \text{ lbs. of pulp (dry)}$$

$$\text{One H.P. per hour beats} = \frac{900}{41.6} = 21.6 \text{ lbs.}$$

This is the evidence that two beaters with the same make of rolls, frames and bedplates can give such different results and hereby the economical value of the high velocity in the tub of the beating engine is proved.

It is proved that a pulp speed of 50 feet per minute produced 1.87 times more in a given time than a pulp speed of 25 feet, not considering the advantageous mixing and the uniform stock obtained by rapid circulation.

As regards beating time, we can safely say that in a modern beater without the use of a Jordan, news pulp should take 35—50 minutes; wrapping with 25 per cent ground wood, 45 minutes. Extra strong wrapping 60—80 minutes. Pure Mitscherlich sulphite (in-to strong stock) 120—160 minutes. Pure Ritter-Kellner sulphite 80—120 minutes, etc., etc., and here considerably better results can be obtained.

This is to be the actual beating time under consideration of rapid pulp circulation, roll counterpoising, large actual beating surface and a sufficient amount of "cutting lengths."

Following the unproductive work to be rendered we have to consider:—

Friction of Flybars on the Pulp.

$$\text{Fr} = \frac{0.25 \times 12 \times \text{Tf} \times \text{W} \times \text{V}^3}{550} \text{ in H.P.}$$

EXAMPLE:

Tf = 0.375 in.: pulp speed W = 50 ft. min. = 0.835 ft. sec.
V = 28 ft. sec.

$$\text{Fr.} = \frac{0.25 \times 12 \times 0.375 \times 60 \times 28^3}{550} = 2.7 \text{ H.P.}$$

The friction of the flybars on the pulp in tub of the beating engines as being described above is 2.7 H.P.

Friction in the Bearings.

$$\text{Fb} = \frac{\text{Pr} \times \text{U} \times \text{dia.} \times \text{II} \times \text{R.P.M.}}{60 \times 550}$$

EXAMPLE:

U = Co-efficient of friction = 0.05.

Pr = Weight of roll in lbs. including pulley = 1600

Dia. of bearing in feet = 1.75

R.P.M. = 90

$$Fb = \frac{16000 \times 0.05 \times 0.75 \times 11 \times 90}{60 \times 550}$$

$$= 5.1 \text{ H.P.}$$

Total Power Consumed in Beating Engine as per Our Example.

Productive.	B.H.P.	Unprod've. B.H.P.	Total
Actual beating..	31.6	Acceleration 18.5	
		Bearing friction 5.1	
		Friction of flybars on pulp 2.7	
	31.6	26.3	26.5
			31.6
			57.9 B.H.P.

Materials for Flybars and Bedplate.

Generally a strong steel bar of sufficient thickness gives best results. For papers made from bleached pulp, strong bronze bars of not less than 3-8 in. thickness can be used. Special care has to be taken to fasten the flybars properly. Damages are less caused on account of the bronze than on account of too weak a connection. Bronze of $\frac{1}{4}$ in. thickness will give away should a paddle pass the beating surface.

Basalt lava slabs recently have been often used. As basalt is very porous, the fibres find many cutting edges, whilst at the same time, the heavy stone slabs increase the weight of the roll.

We may mention here that the very old "Hollander" with stone rolls has been redesigned by the German paper maker Schmidt, whose rolls are now sold on this continent. For several years Helin's beating material composed of chilled porous castiron has been employed and renders good results for the manufacture of strong papers. The numerous pores in this material give the fibres opportunity to rest against and to become fibrillised.

In general, the flybars are still secured to the roll by shrinkings, the design of which has been considerably improved. Stone and cast-iron slabs are preferably cemented into a castiron body being provided with ribs for the purpose. The sides of the rolls are then covered with a heavy cement coat.

Conclusions.

Beating engines should be designed for a rapid pulp circulation. Rolls should be heavy, should be provided with amply dimensioned spaces between the flybars and should have a counterpoising device.

Beating Material.

The writer, having travelled over the American and European Continent, only can say that paper makers' opinions on this point are very much opposed. According to paper mill experience, I know that a large beating surface, a proper amount of "cutting lengths" in connection with a sufficiently heavy roll and a large velocity in the tub, are all one requires to "make" paper.

I have seen grease proof paper made with steel bars, with bronze bars and with stone rolls. Some people beat news print in double beaters fitted with one stone roll and one steel roll; others, use no beater at all, and say the Jordan is the only thing.

My father said, during 40 years of managing all kinds of mills, that he got the largest speed on the paper machine (700 feet per minute), with strong Mitscherlich, carefully made ground wood and with high velocity beaters with steel flybars without Jordans. For fine papers he used bronze flybars only. Another paper maker known to me uses nothing else than Horne engines. The farther you travel, the more the opinions diverge.

Indeed, the funniest beater designs have been created with screw propellers, revolving wing propellers, with small rolls, with large rolls; but one could not get away that the pulp has to be mixed and to be beaten and this on a well dimensioned beating surface under a proper pressure, and that there must be sufficient edges for the pulp to lie against when it is to be drawn out and fibrillized. The flimsy designs will go and pretty soon we will see our old-fashioned Holland beater reinstated with the good old open tub, which you can clean so easily, but it will look somewhat different though. It has grown in height and looks sturdier.

The Tub.

Wood, castiron, plain concrete or plated, all should be designed to avoid depositing of lumps. The beater should fulfil the demand of the machine tender. "Give me a clean and strong stock and I will run it off as fast as you want me to."

Prices are low now-a-days and it takes a lot of hard thinking how the most profit can be made on an order. Sometimes there are very small profits only. There, the only salvation is the speeding up of the paper machine, to use clean and strong stock in order to get the speed and to use sturdy, well mixing, speedy beaters to get the clean and strong stock of the cheapest possible combination of raw materials. The paper is made in the beater and run off on the machine.

DRYING PAPER SHEETS.

A patent has been granted to Mr. W. E. A. Hickson, of Wellington, New Zealand, for a new process as follows:—

Sheets of paper supported on an endless web or band are dried by currents of air introduced above and of hot air introduced below. Beneath the drying chamber are fixed a series of heating chambers spaced apart and communicating with the drying chamber through transverse slots. Each chamber contains a burner over which lies a baffle. A longitudinal air pipe extends along the drying chamber, and is supplied with air from a blower; it is provided with valved branch pipes which direct air through apertures or nozzles on to the paper. The burner comprises an outer pipe connected with a gas main and having burner jets along its length; air is supplied through an inner pipe connected by a branch with the main pipe which also supplies the pipe. Hinged flaps are provided at the ends of the drying chamber, and inspection doors for the chambers.

THE PRODUCTION OF PAPER FROM BAMBOO

"Paper Making," London, reports that for some time past important experiments have been conducted by Mr. James L. Jardine, of Esk Mills, Penicuik, in the manufacture of paper from bamboo. The results have proved highly successful, and the process has been patented by Mr. Jardine, in conjunction with Mr. Thomas A. Nelson, of Parkside Works, Edinburgh. Mr. Jardine has introduced a modification of the bisulphite process, and has succeeded in producing an easy-bleaching pulp from bamboo. The invention practically consists in cooking the decorticated material in a digester with a solution of magnesium or sodium bisulphite, or an acid sulphite with a surplus of available SO_2 , and completely removing from the liquid in the digester the gases liberated in the course of cooking. It is understood that paper has been manufactured on a commercial basis with the most satisfactory results.

The following particulars are given in the complete specification:—

A commercially bleachable pulp cannot be produced from bamboo or similar vegetable growths, the incrusting ingredients of which are mixtures of lignin and pectose, or substances chemically similar, by any of the bisulphite processes as employed for extraction of pulp from wood and the like lignified substances. We have discovered that this due to the excessive acidity of the liquor as used in the process of digestion, caused by the liberation and retention in the digester of the sulphurous acid gas.

In the modern day wood pulp process where the digester is internally heated, the sulphurous acid gas liberated in the heating and cooking is, as far as practicable, kept in contact with the pulp, and only quantities are allowed to escape from the digester sufficient to admit of the entrance of enough steam to secure and maintain the proper cooking temperature, this being controlled by direct thermometer readings.

If bamboo and the like be treated in a similar manner a secondary reaction occurs in the later stages of the cooking which upsets the chemical equilibrium and a brown aldehydic product is deposited on the fibres, rendering them commercially unbleachable, or if the hydrolysis is lessened to prevent the desposition of this organic reducing agent the resolution is incomplete, and although a light yellow coloured pulp can be secured it does not bleach as the fibres are still combined with or incased in encrusting ingredients.

Our invention consists in a process whereby these difficulties are overcome, our method ensuing that the lingo and pectic constituents, along with the coloring matters, and the like, are so thoroughly removed that the subsequent bleaching for the production of a white pulp does not need more of the usual bleaching agents than are required for pulps already used in the trade.

In the process forming the subject matter of the present invention, a base which yields a soluble sulphite must be selected, such as magnesium, or sodium, or their equivalents, and to it is added in any convenient manner sulphurous acid gas, as in certain known processes for the resolution of wood, but according to the invention these chemicals are so used for the produc-

tion of paper pulp from bamboo and the like that the deposition of an aldehyde is prevented, and only the proper degree of acidity is maintained to sulphonate the lignin, leaving the base free to resolve the pectic and coloring ingredients.

Magnesia does not readily dissolve in weak sulphurous acid, and thus when its solution is effected by any of the ordinary processes, the resultant liquor generally shows at least the bisulphite proportions of SO_2 . Sodium sulphite, on the other hand, is readily soluble, and we find a solution containing three-fifths or thereby, of the bisulphite equivalent provides a liquor with a surplus of available SO_2 , so rendering it suitable for our process. This constitutes what might be called an acid sulphite solution.

In order that the fibrous tissues may rapidly and uniformly absorb the liquor, their colloidal adhesions must be broken down by mechanical crushing. The raw material after receiving this preliminary treatment is packed in a digester, the prepared liquor is added, and the heating and cooking is secured by the application of direct steam.

It is advisable not to fill the digester too full, as space is necessary for the free separation of the gases evolved from the liquor, and as these are liberated they must at once be removed, and for this purpose a continuously free exhaust fixed in the highest part of the digester is kept open throughout the entire cooking. The escaping steam and gas may be passed to a cooling coil or condensing apparatus for SO_2 recovery in any known manner.

So thoroughly must the gasified SO_2 be removed, that no opposing pressure is created in the digester; the cooking temperature is thus at all stages directly equivalent to the steam pressure, and no thermometer need be used.

The stage of resolution is easily determined by a test of the total sulphurous acid percentage contents of the liquor, and as the reduction of this towards the finish of the cooking is gradual, the most advantageous point of exhaustion can be secured. Throughout the digestion by the removal of the gasified SO_2 the degree of active acidity automatically regulates itself to suit the condition of the pulp and the holding capacity of the base; thus there are no complications, and resolution proceeds along regular lines.

To secure the complete removal of the incrusting ingredients, sufficient free or available sulphurous acid to sulphonate the lignin need be provided, and as variations in the proportions of this substance occur, it is advisable to have excess sulphurous acid in the liquor at the start of the digestion, the surplus being liberated and readily removed in the manner already described. Or the excess may be otherwise removed.

Any increase in the proportion of the pectose constituents requires a corresponding increase in the percentage of the base, but under all conditions excess of this must be provided as it ensures complete resolution and the consequent slow reduction of the liquor strength in the last stages of the cooking.

Having enumerated the principles of our invention, we now give working details of a method as applied to the common bamboo of the West Indies.

This bamboo must be very thoroughly and uniformly crushed, cut into convenient lengths, and packed into a vertical digester with acid proof lining. Between

10 and 12 lbs. of the crushed material can easily be packed into each cubic foot capacity of the digester, and about one gallon of liquor is required for two lbs. of bamboo, or on the weight basis this means roughly 5 to 1.

A suitable liquor made in a known manner from a magnesium base gives the following SO_2 analysis:—

	Per Cent.
Total SO_2	3.25
Available or free	1.80
Combined	1.45

When the digester is furnished, the lid is fixed and a small exhaust pipe connection is made to a cooling coil which has a free outlet into an absorption apparatus forming part of the liquor making plant. The steam is applied to the digester and the full gauge pressure of 7 1/2 lbs. or 5 atmospheres is reached in three or four hours.

The air and surplus sulphurous acid comes off very rapidly during the heating up of the contents, and the full capacity of the outlet is then required, but thereafter, to prevent steam waste, it can be curtailed by partially shutting the outlet control cock. The rate of gas liberation in the further stages of the cooking is relatively slow, and thus a smaller outlet is sufficient.

Under these circumstances the condensation of steam in the cooling coil during the cooking amounts to 15 per cent, or 20 per cent of the volume of the liquor added, and the sulphurous acid recovered is 20 per cent to 25 per cent of the original.

The removal of the surplus or gasified SO_2 is necessary for the chemical reasons already stated, for if this is not thoroughly effected the acid unduly preponderates, preventing the alkaline base from having freedom to remove the pectose constituents or completely upsetting the chemical equilibrium and depositing the aldehyde.

Care must therefore be taken to ensure that all the gasified SO_2 escapes from the liquor, and to a certain extent the process can be hurried by arranging for a larger steam escape in the later stages of the cooking, as this more rapidly carries off the traces of free SO_2 allowing the base to more quickly effect the removal of the coloring and gummy substances.

After reaching full pressure, ten to twelve hours are required to complete the cooking process, this being carried on until the total sulphurous acid percentage contents of the liquor, as ascertained by direct test with standard iodine solution, is very much reduced. A suitable and satisfactory final strength, where dry steam has been used, is about 1 per cent.

When this stage is reached, the steam is shut off, and that contained in the digester is either blown out direct to atmosphere, or it can be condensed through a cooling coil, though the latter process is not necessary from the point of view of sulphur economy, seeing the bulk of this element which is not required in the chemical action has ere this escaped and been recovered.

After the pressure has been sufficiently reduced, the contents of the digester are blown out, and the resultant pulp is of a greyish white color. The yield is fully 50 per cent of the original weight of bamboo furnished.

The pulp can be bleached by ordinary methods to a full white with about 12 per cent of bleaching powder calculated on the dry weight of pulp.

Talc in Paper Making

Loadings used in paper manufacture not only increase its weight, but give it the necessary whiteness, opacity and absorption, and also improve the surface of the finished goods.

Progress in paper chemistry and machinery construction has given new impetus to the employment of minerals which have been wrongly looked upon as mere weighting agents. Now it is fully understood that certain papers cannot be made, or at any rate will not be put to their intended uses without the use of a filling such as china clay, and lately talc has also been found to possess certain advantages. The Austrian firms interested in talc have gone deeply into the question of the various uses to which it can be put. The whole of their information as concerns the paper trade has been placed at our service, and we need hardly say that the Austrians have by no means a monopoly of the talc supply.

The Austrian paper-makers report as follows respecting certain uses of talc:—

1.—They had been vainly trying to produce marketable Chinese absorbent paper; it was only after using talc that the paper passed as a good imitation.

2. They have used fine talc for rotary printings with success.

3. Blottings made of mechanical pulp with an addition of mineral loading are more absorbent than those made from rags.

Very little starch is necessary for the maintenance of talc in pulp. No mineral can be compared with talc for superficial affinity. When combined with rosin size it gives a very considerable degree of impermeability to water to the paper. A well-known lithographer recently stated that paper prepared with talc answered all his requirements. Some paper manufactured for chromo work contained 19 to 20 per cent talc. When burnt it gave 15 per cent ashes. The composition of the paper was as follows: 50 per cent wet pulp, 20 per cent cotton, 20 per cent talc, 10 per cent waste papers, plus size and color. This produced a paper of superior quality which took the most delicate impressions.

Action of Talc During the Various Phases of Manufacture.

Animal Sizing.—Experience has shown that animal sizing is more effective in papers to which talc has been added, as the size distribute itself equally in the web and corrects the tendency of the paper to wrinkle through expansion and contraction.

Damping.—Talc papers can be more evenly damped than other papers, as the fine talc particles have no tendency to deposit themselves on the wire on the underside of the web.

Glazing.—The addition of talc for the production of ordinary or fine papers, whether machine or calender glazed, is of great advantage, particularly for papers containing mechanical pulp and intended for illustrations, as well as for papers to be used in the manufacture of opaque envelopes.

Reeling.—Papers containing talc have a certain suppleness, and as the paper extends in a uniform thickness on the wire the reeling and re-reeling can be accomplished without difficulty, as there is an absence of dust and friction, and the rolls of rotary machines can be tightly rolled.

Cutting.—The work of the slitting and cutting machines is greatly facilitated, as talc prevents the formation of blisters and other irregularities during the

felted of the paper, and gives a suppleness to the sheet which makes it lie flat.

Strength.—Comparative trials have shown that paper loaded with talc is exceptionally strong.

Beating Errors.—When pulp has been beaten excessively, the addition of a determined quantity of talc puts matters right. This especially applies to such papers as must be free from a parchment-like appearance.

Employment of Talc for Various Papers.

Writing Papers.—The uniform distribution of the tiny particles of talc on the vegetable fibres results in the production of a high-class paper.

Document Paper.—A lasting whiteness can be imparted to the best rag pulps if a slight quantity of talc is added to the beaters and a good free rosin size is used. Papers so treated can be used with advantage either for writing or printing.

Book Papers.—A limited quantity of talc in book papers containing large or small proportions of wood pulp and straw improves the opacity and improves the surface for writing or erasing purposes. A mixture of potato starch and talc to the sizing is also a great improvement.

Note Papers.—Very thin note papers cannot contain any mineral loading, but for the thicker sorts made from wood pulp it is advisable to use a small quantity of talc. If the talc is of superior quality it will be difficult to distinguish such papers from those made from rags. The addition of a good mineral loading also gives note papers the required quality for writing or type-writing.

As talc distributes itself very evenly, it imparts a glossy surface to paper which permits of rapid writing. It also diminishes the transparency, and is a great factor in making paper lie flat and remain so, even after having gone through the copying machine.

Typewriting Papers.—Fine qualities of talc should be used in the production of typewriting papers. It ensures clearness of type, and enables more copies with carbon paper to be made at a time than in the ordinary way. Press copied paper will not smear, and the sheet will retain its even surface.

Envelope Paper.—When making these papers both the quality of writing and folding have to be taken into consideration, and when opacity cannot otherwise be obtained minerals have to be used. For this purpose talc improves the character and appearance of the paper, and assists in the production of a high glaze. When well calendered and otherwise properly treated paper containing talc can be used to great advantage for the production of high-class envelopes.

Legal Stationery.—Though the employment of mineral in these qualities is somewhat limited, yet the use of talc in the thicker sorts is of considerable advantage as these papers must possess the double nature of a writing and printing paper, and are often used as typewriting papers. The employment of minerals, therefore, and especially of talc, greatly facilitates the production of paper requiring all-round qualities.

Music Papers.—These are made in various qualities, and the addition of minerals is more or less necessary in order to increase the plastic effect of the surface, and make the reading more easy, as the addition of minerals diminishes, or even quite abolishes the transparency of the paper. Music papers are very much exposed to light, and therefore quickly discolor, but those loaded with talc have been found to withstand the action of light to a remarkable degree. The discoloring of mechanical pulp is much reduced, and completely avoided in the sorts made from cellulose. As

in all special papers the manipulation of the materials and their work on the machine are of great importance.

Printing Papers.—The use of talc in the superior qualities which require light sizing ensures suppleness, and is most economical. Talc gives a close surface, secures a uniform thickness, and facilitates the printing. In making papers for half-tone work the employment of talc is very important, as the talc intimately binds itself with the pulp so that no dust is produced during rotary printing, and the resistance is relatively very little influenced. The suppleness and elasticity of the produced sheet enables it to adapt itself so closely to the printing rolls that even at high speed the blocks and type come out neat and clear. The dust generally attributed to the minerals used has been found more than once to be composed of vegetable matter and not mineral. Talc prevents the formation of dust, as it is an agglutinant for rag fibres and for chemical and mechanical pulps.

Bank Notes.—Very little mineral substances are added to these papers, but a small amount of fine talc gives them resistance against repeated rubbing and folding, and favors the fineness of the designs that have to guarantee the printing against fraudulent imitations.

Lithographic and Map Papers.—Bad results given by faintly glazed papers for lithographic and typographic purposes have been obviated by the judicious addition of a mixing of superior talc in the beaters.

Illustrated Papers.—The addition of talc to pulp used in the production of faintly-glazed papers for illustrative purposes secures the required results.

Artistic Printing Paper.—The extreme fineness of talc favors its use for the production of the finest papers intended for artistic printing. Its addition facilitates the fixing of coloring matters. Moreover, the irregular composition of the sheet after sizing with potato starch, casein and silicate, which is generally unavoidable, is quite overcome when talc is added to the preparation.

Advertisement Papers.—The appearance of these, in spite of their inferiority, is of primary importance, while their durability is practically of no consequence. Talc is a very valuable assistant in the production and prospectuses. As regards posters, it has the particular advantage that old posters do not show through those pasted over them.

News Papers.—Talc increases the facilities of printing, diminishes the transparency, and makes the paper supple. The employment of this mineral is most suitable for flat or rotary printing. The opacity which talc imparts to the paper makes the type pronounced.

Drawing Papers.—As talc has the property of mixing itself intimately with the fibres and becoming transformed through the addition of rosin and casein into an agglutinant it favors the conditions required for a good quality drawing paper which must be elastic to allow erasing and washing. The fineness of the talc ensures a uniform surface so that calendering can be diminished or suppressed, as a matt surface avoids the bad light effects.

Artistic Drawing Papers.—This kind of paper requires careful treatment in the beater and a liberal addition of talc ensures the production of clear designs on the finished paper. Thorough mixing in the refining machine is most essential.

Rough Drawing Papers.—As rough drawing papers need to be very resistant the refined pulp should not be excessively beaten. Light beating, however, results in a rough surface, which renders drawing difficult and its appearance ragged. To remedy this defect it is and the uniformity it imparts to the surface of paper,

and the uniformity it imparts to the surface of paper, tale is undoubtedly the best loading for these papers.

Absorbent Papers.—This class includes filter papers, blotting papers and brush-writing papers. With regard to the last-named, the Chinese usually attach to their order a sample giving the degree of the absorption required to secure good brushwork and to ensure good results with the ink used. Numerous trials are often necessary to obtain the required conditions, and in this instance tale has always given the most satisfactory results.

It is advisable to employ tale for blotting papers in which poplar pulp is included, whereas for rag absorbent papers minerals should not be used on account of their obstruction of the pores of the paper.

Paper Tubes.—Tubes employed for various textile purposes are produced at the rate varying from 60 to 600 per minute. If the adhering properties are not acquired a great deal of waste is incurred, and if by inattention or oversight a defective tube gets on the spindle the threads entangle and break, causing delay and loss. To avoid this tale should be added to the pulp to ensure proper adhesion of the tubes.

Wrapping Papers.—The employment of tale for cheap qualities is to be recommended as it reduces the losses sustained on the machine. The writer has been able to produce paper which had no oxidizing effect on the polished metal parts of the beater simply by adding a little tale to the stuff. This addition rendered the bleach that remained in the stuff completely ineffective. These papers must be weakened as little as possible in bleaching, and worked without chlor or acids. A small proportion of good quality tale has proved admirable in the making of papers for electrical purposes, as the pores were tightly closed, so that the electric wires were protected against atmospheric influences.

Packing Papers.—Packing papers and highly-glazed envelopes are made more supple and their strength unappreciably diminished if tale is added to the pulp. They do not crush during calendering. An addition of cheap tale to sugar papers ensures their suppleness despite their weight. Paper made with a liberal addition of tale can be used for wrapping butter instead of the more expensive parchment papers.

Envelope papers produced entirely from wood pulp and a proper proportion of tale have the character and appearance of papers made from rags or hemp, so that it is difficult to distinguish one from the other. For blotting materials that have to be bleached with sulphur 10 per cent of tale added to the beater results in the production of a paper that practically retains the original whiteness of blotting; whereas the non-loaded materials lose their whiteness more or less.

Anti-rust papers for needles are made damp-proof, and have a good surface and pleasing appearance if tale is added. Even those made from substitute are as supple as those made from rags.—Papermaking.

SOOTY PARTICLES IN PAPER.

It often happens that in large towns particles of soot find their way on to the Fourdrinier and cause black specks in the paper. The only remedy appears to be to filter the air entering the shop through fine wire netting, in which case, however, fans may be necessary to overcome the resistance offered by the fine mesh to the entry of the air. The firm of Schering, at Berlin, has been compelled to adopt this arrangement for making fine papers destined to be used for photographic purposes. The wire blinds have to be cleaned at frequent intervals, usually every Sunday.

The Waste of Rosin

An important Scandinavian paper mill has for a long time been carrying out researches directed towards the disuse of rosin for sizing printings. The printers complained, however, of the papers first sent to them without rosin size. They made three distinct allegations:—

1. That the ink went through the paper.
2. That the paper needed more ink to get a distinct impression.
3. That the act of printing disturbed the surface of the paper, causing fluff and dust.

Two remedies were soon found, and are here given under the heads corresponding to the complaints.

1. To remedy the overpermeability to ink, a special ink was made, containing more dry matter and no turpentine. Properly used, this ink gave excellent results.

(This has a very unpromising sound. When it comes to demanding that printers shall use a special ink, the paper maker will get left.)

2. To remedy the waste of ink, the fibres were more closely united, during the manufacture of the paper by adding some starch to the pulp and the plan answered well. Half a per cent of starch with a preliminary mordanting with half a per cent of sulphate of alumina fulfilled the purpose completely. Casein can be employed instead of starch.

Many experiments have shown that there was less loss of filling, and loose fibres, than when free rosin was added in the same proportions.

The fluffing trouble is not further alluded to.

In China, the cradle of paper making, the problem of producing machine-made papers without size has been solved in a very simple manner, the absorbent papers, made to be written on with a brush, being also regularly used for ordinary printing purposes. Nevertheless, the best qualities are sized like European papers, but to a less extent.

At the present day, in mills where the managers do know how to work scientifically, where the hollandering is badly done, and where the composition of the pulp is not suitable to the purpose intended, rosin is literally wasted. Experiment has shown that with coarse pulp, especially mechanical pulp, a small amount of rosin is sufficient, and that any further is sheer waste, as it has no further effect on the character of the web. Even with papers which must be strongly sized, it is generally possible to save rosin and at the same time to improve quality by adding a little bleached straw pulp.

The time when rosin was used, so to speak, as a filling on account of its low price, is past, and at the same time we often meet with mills having no just appreciation of the economy possible in its use. The dirtying of the wire and felts, and hence the necessity for their constant replacement by new ones is disregarded, but paper makers wishing to keep pace with the times should pay due attention to these points.—La Papeterie.

Balsam fir, a tree which a few years ago was considered of little value, is now in demand for pulp wood. This demand has been brought about by the enormous expansion of the pulp industry during the past two decades.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY.

MR. T. A. WELDON,

Vice-President of the Provincial Paper Mills Company.

A young man walked into the office of the E. B. Eddy Company at Hull on a Good Friday morning about thirty years ago and pleasantly inquired if Mr. Eddy was in?

"No! this is a holiday and we scarcely expect him around" was the answer of a member of the staff. "I beg your pardon," said the caller "I had completely forgotten about this being a holiday."

As he was about to depart a gentleman with long whiskers and smoking a pipe, entered. "There is Mr. Eddy now," came the information and, with that introduction, the visitor stepped up with the remark "my name is—Weldon—T. A. Weldon, of Toronto, and I heard that you were wanting a traveller to represent you in Toronto and Western Ontario. I am with the wholesale grocery firm of Sloan and Crowther."

"Come into the office," remarked Mr. Eddy, as he led the way, and right then and there began a friendship and close association between the two which lasted until the great capitalist match and paper king passed away a few years ago.

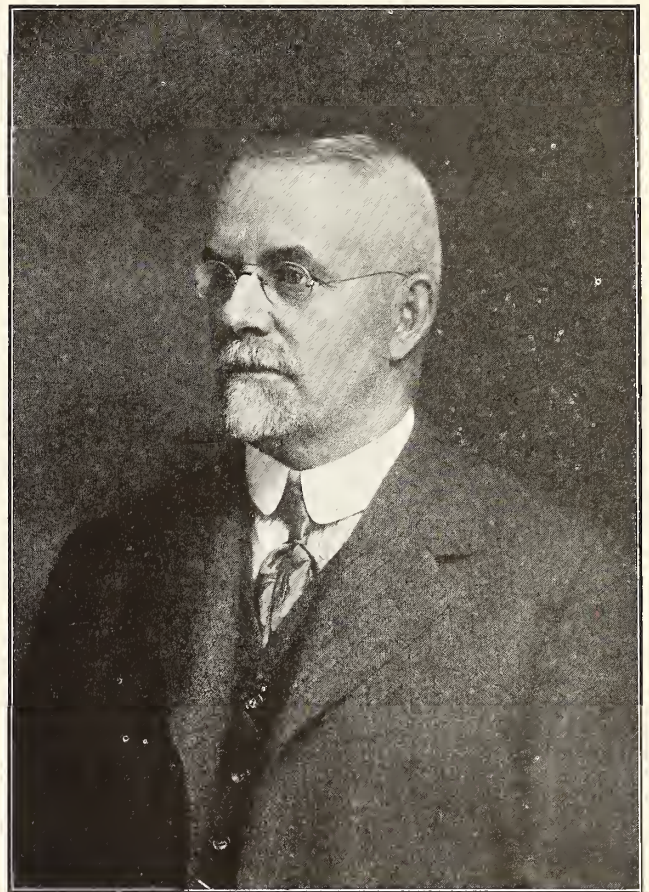
"Yes," said Mr. Eddy, after a general conversation, "I may tell you that we are looking for a man and we have had some eighty applications for the position already, a number of whom have sent their photographs along with letters and testimonials. But you are the first man who had the "sand" to come down here and spend twenty-five dollars to interview me personally. Now if there is one quality that I like it is "sand." I will come to a definite decision in this matter in a few weeks and, perhaps, you will hear from me later."

About two months after Mr. Eddy came to Toronto one day and inquired for Mr. Weldon, who happened to be out of the city. On his return in the evening he was informed of the visit and went down to the Queen's Hotel to meet the manufacturer from Hull.

"Well, I guess you can come to work for me," observed Mr. Eddy, "When can you start? I would like you to begin almost immediately." Mr. Weldon said that he thought he could make arrangements to that effect and was told of the territory he would be required to cover.

Not a word was said regarding salary. Mr. Weldon did not name a figure and Mr. Eddy never inquired what he wanted. When the former got his first cheque, however, it was much larger than he expected. Until five years ago when Mr. Weldon and other gentlemen, including his life-long friend, G. R. Copping, of Toronto, bought the plant of the Montrose Paper Mills at Thorold (then in liquidation), and assumed the control, resigning his position as manager of the Toronto branch of the E. B. Eddy Co., he was with the latter organization a quarter of a century. When he started with the E. B. Eddy Co., they were then making matches and certain lines of woodenware, their sulphite plant had just begun operations and they were thinking of branching out extensively in the news print and wrapping paper lines. After travelling a little over a year and meeting with splendid success, Mr. Weldon was requested by the Eddy Co. to take charge of the warehouse which they were

opening in Toronto, as they intended to carry stock and make the city a distributing point for Western Ontario, Mr. Weldon's brother, Robert, taking his place on the road. The first site was at 29 Front Street West and business grew so rapidly that soon a removal was made to 38 Front Street West. When the big Toronto fire occurred in 1904 and wrought such havoc in the down-town wholesale section, the Eddy company were among the sufferers who were completely cleaned out. Then the business was removed to 5 Front Street east where it was continued until



the erection by the firm of the large and imposing building at 73 Wellington West. In the course of his work Mr. Weldon called not only upon the wholesale trade but upon the newspapers selling news print. When he became identified with the Montrose Mill and was leaving to take up his residence in Thorold, the press of Toronto paid him many tributes, one leading publication, with which he had done business for many years, remarking that he "was the most widely known, the best liked, the most courteous and pleasant man in the trade with whom they had ever done business, and yet he always upheld the interest and integrity of his firm."

Going to the Montrose plant, the new manager at once set to work to overhaul it and expand the busi-

ness. How well this task has been accomplished may be judged from the fact that the output was then only about five tons per day. The old machine was given attention, new equipment added and later another machine, 140 inches wide, installed as well as a fine new mill built, making the output to-day about thirty tons of book, bond, writing and linenette papers, which command a wide market. The Montrose plant was subsequently merged with the St. Lawrence Paper Mills Co., whose mills are at Mille Roches, and at the head of which is Mr. I. H. Weldon, a brother of Mr. T. A. Weldon.

Later further expansions took place, the Provincial Paper Mills Co. was organized, and the historic and old established Barber plants at Georgetown acquired, Mr. John Barber retiring from the trade after half a century of active connection with it. The Provincial Paper Mills Co., of which I. H. Weldon is President, S. F. Duncan, Sec.-Treas., and Mr. T. A. Weldon, Vice-Pres. and Manager of the Montrose Division, are the largest concern of the kind in Canada and operate plants at Mille Roches, Thorold and Georgetown, being capitalized at five million dollars, and having an output of seventy tons per day of book, bond and writing papers, as well as a coating paper plant with seven machines. Their head offices are in the Bell Telephone Building, Toronto, and Mr. Weldon makes weekly trips to the city in the interest of the selling and administrative part of his division.

Of Irish extraction, Mr. Weldon was born on a farm in Cartwright township, in Durham county. His father came from Tyrone and his mother from Fermanagh, Ireland, and were among the pioneers of Ontario. They raised a family of seven sons and seven daughters. Later they removed to Oxford country, locating near Woodstock. The open air life on the farm and the active work performed by Thomas Andrew, who was the oldest of the children, laid the foundation of a strong constitution. He never knows a day's illness and his good health is as proverbial as his cheerful disposition. Mr. Weldon's parents are still living and St. Thomas is their home. His father has acquired the ripe old age of ninety-three and has been married over sixty-four years. He is still as supple and energetic in getting about as many men half his years. At the age of twenty, Mr. Weldon thought he would like to enter upon a business career, and learned the grocery line. He afterwards went south for five years, and settled in the State of Delaware, where he followed peach farming, at which he made considerable money. Returning to Canada, he attended a business college in Hamilton to round out his education and on the completion of his course, came to Toronto and joined the travelling staff of the firm of Sloan and Crowther (now John Sloan and Co.) covering Western Ontario and specializing in the sale of canned goods. It was while thus engaged that he formed his connection with the paper trade by entering the service of the E. B. Eddy Co., in the manner already narrated.

Many of the young men who are at the head of the big paper houses to-day, were mere beginners when Mr. Weldon first became identified with the trade thirty years ago. They called him "Tom" then and do so yet. He is genial and affable under all circumstances and, although a resident of Thorold only a few years, yet at the last municipal election in that town he was offered the Mayoralty without opposition, both candidates volunteering to retire in his favor. His business interests claim so large a portion of his attention that he had to decline, much to the regret of

the ratepayers. As a private citizen he has, however, taken much interest in the community and helped to advance its welfare in many ways, having seen it develop during the last two or three years into one of the most important pulp and paper centres of Canada, Thorold and Merritton possessing no less than nine or ten industries in this line, all of which are flourishing.

Mr. Weldon resides at "Hillcrest," a beautiful home situated on an elevation above the town of Thorold commanding a magnificent view of the surrounding country. Fond of a good story, he is generally able to tell one too. He often relates one regarding the late Mr. Eddy, who took him into his office one day shortly after he entered the service of the firm and, pointing to a line running from the top to the bottom of the wall, the paper magnate said "Do you see that line?" "I do," replied Mr. Weldon, "but I do not notice anything peculiar about it." "Well, it is perfectly straight," genially responded Mr. Eddy, "and now you can work for me as long as you keep like that." And Mr. Weldon did work for Mr. Eddy as long as he lived and for his company for some years after.

At curling, Mr. Weldon, when living in Toronto, frequently took a hand in the "roarin' game" with the Queen City Club. He is also a lover of horses and keeps a good stepper. In earlier days, it was his delight to mount an animal and take long rides. But paper interests are his chief concern now. At his work in season and out, he is a long way from being "weary in well doing" and in seeing that the customers of the Montrose mill get good service, prompt delivery and a superior product.

THE HYGIENIC VALUE OF PAPER.

It is hard to realize in our advanced state of civilization, the consequences of being deprived of what has hitherto been regarded as one of the necessities of life. The rumors of a shortage in the supply of paper in England on account of the war causes one to reflect upon paper and paper-making itself.

Not until 1685 was the art introduced into England, but it is only within recent times that the possibilities of paper as a material of some hygienic advantages have been recognized. In an interesting paper upon the subject read at the Congress of the Royal Sanitary Institute at Blackpool by Dr. S. Rideal, D.Sc., the use of paper is recommended for home articles in daily use which require frequent washing. It is suggested that such movables as plates, cups, and even dustbins, should be made of paper, and destroyed when soiled. The use of paper handkerchiefs has been advocated for consumptives for some time past, and the paper serviette has come to stay.

The ordinary housewife, we fear, would think twice before being beguiled into substituting paper blinds, curtains, tablecovers, and towels in place of ordinary linen goods, sanctioned by custom and tradition. They might obviate danger of infection, being only used once; but, unless rendered non-inflammable, they would be highly dangerous. The use of paper disinfecting bags containing formaldehyde, for dealing with infected clothes, described by Dr. Munson, appears to solve some of the problems of domestic infection, while these receptacles are of service as emergency disinfectors for army use.

If paper bag cookery be not always practicable; there must be several ways in which more extended use of paper should appeal to medical men and sanitarians on hygienic grounds.—Medical Press.

Ottawa Notes

Ottawa, Ont., November 10.—Lumbermen and paper manufacturers in Ottawa are now face to face with an increase in fire insurance rates of 50 cents on the \$100 on plant and lumber yards as a result of the unsatisfactory water situation in the Capital.

The Canadian Fire Underwriters' Association yesterday instructed all local insurance agencies to increase rates in Ottawa immediately. The increase is one of 50 cents on the \$100 for one year on nearly all kinds of mercantile and manufacturing risks, and all rates on lumber yards. This is partly due to the non-compliance of the city with the demand recently made by the Underwriters' Association that a new overland water pipe be installed by the city, and that meanwhile three new fire engines be purchased. The necessity of taking these precautions was urged on the City Council recently by a deputation from the Ottawa Board of Trade, of which Mr. E. R. Bremner and Mr. Gordon C. Edwards were spokesmen while lumber and paper manufacturers were active in advocating such a course. A letter written by Mr. J. R. Booth two years ago suggesting an overland pipe was also read at this meeting.

The insurance increase is a serious matter for lumbermen and paper manufacturers who are very large policyholders, and coupled with the fact that the rates are higher is the fact that the fire protection facilities at present afforded are, through the lack of water pressure, very poor.

There were two incorporations of pulp and paper companies at Ottawa last week, a somewhat unusual thing since the outbreak of war. The Nairns' Falls Power and Pulp Company was incorporated with a capitalization of \$100,000 and head office at the village of Malbaie, Que. Among its incorporators are Louis Alexandre Martin, civil engineer; Laurent Guillemartin Morin, broker, and William Edward Morgan, manufacturer, all of Montreal. The Chaleur Pulp and Lumber Company, Limited, of Montreal, will carry on a general lumber, pulp and paper business with a capitalization of \$75,000.

According to the Commission of Conservation the Laurentide Pulp and Paper Company of Grand Mere is making an experiment which has not been tried before by any Canadian paper company as far as is known. This is in the importation of reindeer from Dr. Grenfell's Newfoundland herd, to be used in the Laurentide limits, instead of sled dogs. It is thought they will prove more satisfactory than the latter.

The Laurentide Company is enlarging its forest nurseries with a view to ensuring the systematic replanting on a larger scale of cut-over lands unsuitable for farming in the St. Maurice watershed. The firm's forest division has surveyed and mapped the company's limits of over two thousand square miles.

That the delay in forwarding shipments of paper from Montreal is seriously inconveniencing New Zealand newspapers and other users of pulp products is indicated in a report to the Trade and Commerce Department this week by the Canadian trade Commissioner in Auckland, N.Z., who states that "importers of newspaper have very scanty reserves and the delay and probable non-arrival of the vessels from Montreal caused much anxiety. Some papers had only a few weeks' reserve in stock. Orders were therefore sent to England, but cannot be filled and delivered under

three months. The situation has been relieved somewhat by the arrival of supplies from British Columbia. There is also some anxiety with regard to the arrival of the Vancouver boats. The importers, however, are anxious to give orders on the Pacific Coast to save delay. There is a good demand for red paper. It is used for the covering of telephone books and just now a number of firms are in need of it to fill contracts with the Government. It would save time in this case if samples and quotations were forwarded so as to be submitted at once to importers."

The low water situation has not improved in the Ottawa Valley, in spite of recent wet weather. Only one lumber firm, the W. C. Edwards Company, is now operating, and the paper companies are in a bad way. Of course every effort is being made to operate as long and actively as possible, and with more rain and mild weather it is hoped by the purchase of quantities of outside pulp to continue paper manufacturing late into the fall.—MAC.

SEA-WATER FOR PAPER MANUFACTURE.

Can other than fresh water be used in paper-making? A writer in "The World's Paper Trade Review" states that there is no suitable method of removing the salt from sea-water, evaporation, being too expensive a process. It is, however, in some cases possible, with the direct use of sea-water to produce well-sized paper. Sea-water, it is remarked, is characterised by a high proportion of chloride of sodium, while the usual hardening components are present in a lesser degree (such as earthy alkaline metals, calcium, and magnesia). Though sea-water is salty, its effects in sizing are less injurious than those of many hard waters (such as final potash lyes when let run into river water).

When sea-water is used, a larger proportion of sizing substances will be required in paper-making, but in the former case papers with a resistant size can be made. The only question is whether the mill is advantageously situated for obtaining raw materials (such as fibrous substances and coal) and labour at a price which will offset the extra expense for sizing materials.

An important question is that of the sea-water to be dealt with. Qualitatively, the sea-water has the same composition at different points, but the various seas have very different proportions of salts in solution. The Baltic contains 0.66 per cent; the North Sea, 3.44 per cent, and the Atlantic Ocean a maximum of 4.26 per cent. Hence the analysis of the particular sea-water is a matter of importance. The effects produced on the sea-water by the waste water of the particular mill is likewise a point for consideration.

Another correspondent states that many mills have had unsatisfactory results from the direct use of sea-water. Among other difficulties has been the effect on brass and copper rollers. The paper produced is said, moreover, to be of a hygroscopic character, attracting the moistures from the air. It is added that to make its use practicable, sea-water requires to be distilled, which, however, increases its cost.

A Swedish factory had the experience that the pulp obtained with sea-water was of a soft and disadvantageous character. Its use is considered as limited to absorbent, cap, blotting and similar papers, while by reason of the wires and felts suffering, its normal and economical use is considered as not to be anticipated.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

Engineers have been busy during the past fortnight in the vicinity of the island mill of the Union Bay and Paper Company. It is reported that the men were employed by the D. and H. to lay out a side track from the Schenectady road to the mill. So far as can be ascertained there has been no change in the property, though a number of rumors have been current that parties have leased the mill.

* * *

According to a decision made by Judge G. W. Ray at a special term of the United States District Court at Syracuse, N.Y., banks that hold bonds against the Battle Island Paper Company of Fulton will be permitted at once to reduce them to ownership by public sale. It is probable since no outside parties desire the bonds that the banks will purchase them at a price which may be as low as from 10 to 25 cents on the dollar. The Syracuse Trust Company holds notes for \$40,000 and bonds with a face value of \$45,000, the City Bank, loans \$17,904 and bonds \$45,000; Third National Bank, loans \$29,500 and bonds \$40,000. Several other banks are represented among the bondholders of the Battle Island Company, the total issue being \$500,000. It is the hope of the bondholders to be reimbursed on the realization of funds from the prospective sale of timber lands owned by the company in Quebec, for which an offer of \$300,000 has been made, and upon the pending award of \$1,800,000 upon a barge canal claim. The last named, however, is problematical as far as the sum to be realized is concerned and upon Quebec lands prior Canadian liens would reduce the amount owed to \$135,000.

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The recent appointment of Hon. John B. Madigan of Houlton, Me., as a member of the International St. John River Commission to fill the vacancy caused by the death of Hon. George A. Murchie of Calais, Me., means the early resumption of the commission's business. Among the most important matters to be decided by the commission will be the regulation of the power development of the Grand Falls of the St. John River. The development is regarded as the largest east of Niagara, the estimated maximum being 80,000 horse-power. When the Commission has finally passed on the matter work will begin on a large pulp and paper plant by capitalists allied with the International Paper Company. Preparatory to the erection of the plant purchases of Maine timberlands on St. John waters have been made, aggregating more than \$1,000,000.

* * *

The Granby Paper Company of Fulton, N.Y., has finished its shipments of pulpwood from Canada, and has a supply of about 6,000 cords on hand at present.

* * *

The Entertainment Committee of the Paper Association of New York City have arrived at a date for the annual banquet, which will be held as usual at the Arkwright Club, 320 Broadway. The date chosen is December 9th, and every jobber of prominence in the Greater Metropolitan district is expected to be present, many of them bringing guests from their mill connections.

Frank W. Summerville, an extensive dealer in pulpwood at Watertown, N.Y., says that the pulp and paper manufacturers of this country who are depending upon Canadian pulpwood entirely or in part, are going to be confronted with a serious situation within a few months. On a recent trip through Canada, Mr. Summerville found very few camps being opened up this winter. He says that the amount of pulpwood cut and peeled last year and now on the market is the smallest in years. The result is going to be that when last year's peel is exhausted there will be no more, and the manufacturers of pulp and paper on this side who are dependent upon Canada for pulpwood supply will be left in a bad fix. "What will be the outcome is hard to foretell," said Mr. Summerville. "The Canadian dealers ask more for their wood than the American buyers think they ought to pay, and the result is that there is little being bought at the present time."

* * *

The Great Northern Paper Co. will cut about the same amount of lumber this season on the Penobscot river in Maine as usual. They now have forty-two camps and will probably have many more. They will do very little, if anything, on the Kennebec. E. B. Weeks is their surveyor-general, and has about 40 scalers under him every season.

* * *

The total receipts of pulpwood at Portland, Me., from the Canadian provinces in the season which has just ended are 59,397 cords, an amount that compares well with the receipts of the past few years, with the exception of 1912, which was a banner year for pulpwood imports, something like 97,000 cords having arrived here.

* * *

The annual meeting of the Empire State Forest Products Association was held in Utica, N.Y., on Thursday, November 12, at the Hotel Utica. The committees that reported were the Legislative Committee, the Transportation Committee, the Forestry Committee, the Finance Committee, and the Committee to Forestry Associations in Conferences with other organizations. Under the leadership of Frank L. Moore, president of the Association, the organization has done a great deal for the wood industry of the State in all its branches.

* * *

Four paper makers of Watertown, N.Y., will go to France shortly to help out the paper-making industry in Paris on account of the curtailment of the labor supply on account of the war.

* * *

The Hoffman-Youman's Paper Mills operated by R. S. Hoffman located on the barge canal island at the south end of the dam, between the river and the barge canal, Baldwinville, N.Y., was badly damaged by fire last week. No reliable estimate has as yet been made by Mr. Hoffman as to the extent of the loss sustained, but rough estimates made by others familiar with manufacturing plants, place the damage between \$50,000 and \$100,000.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

FROM OUR LONDON REPRESENTATIVE

The latest research work concerning newspaper-making materials has been directed toward "Tambuti" (or "Tambookie") grass, (*Cynpopogon validus*), which grows profusely in Natal, the Transvaal and other parts of South Africa. The report which has now been issued is somewhat encouraging. A sample was submitted weighing 12 lbs. and consisted of lengths up to about 5 ft. 6 in., the stems measuring about 1-6th inch in diameter at the base. A chemical examination of the grass gave the following results and the corresponding figures for Algerian esparto grass are included for the purposes of comparison:

	Tambuti. Esparto.	
	P.c.	P.c.
Moisture (on drying at 100 deg.—110 deg. C.)	10.2	8.8
Ash (expressed on dry material) . . .	7.4	3.0
Yield of unbleached pulp (dried at 100 deg.—110 deg. C.):		
(1) Expressed on material dried at 100 deg.—110 deg. C.)	41.3	32.3
(2) Expressed on material air dry material	37.1	29.5
Loss on weight of pulp on bleaching . .	3.1	1.3
Yield of bleached pulp (dried at 100 deg.—110 deg. C.) expressed on original material dried at 100 deg.—110 deg. C.	40.0	32.0
	inches.	inches.
Length of ultimate fibres	0.012	0.012
	to 0.188	to 0.12
Width	0.081	0.045

The report says that, on heating with caustic soda solution under pressure, the Tambuti Grass was readily converted into a light fawn colored pulp, which was very easily bleached to a pure white product. It will be noticed that the yield of pulp is unusually high, whilst the average length of the ultimate fibres is considerably greater than in the case of Esparto Grass. Papermaking trials that have been carried out show that a paper of fairly good strength can be produced from Tambuti pulp and specimens of both the bleached and unbleached product have been on view in London. The report concludes: "The high yield of pulp of good quality, and the ease with which the pulp is bleached, show that Tambuti Grass is well adapted for paper-making and the crude material would probably be worth about £4 (equal to \$18.20) per ton in London. It would, however, probably be more remunerative to convert the grass into 'half-stuff' in Africa and either ship the 'half-stuff' to Europe or utilise it locally for the manufacture of paper."

The attention of Canadian paper manufacturers should be drawn to the fact that in most of the neutral countries, in addition to the United Kingdom, special reports by trade commissioners are being made on openings in the Dominion for paper men to do busi-

ness. The British Board of Trade has included its report in a Bulletin issued on the German and Austro-Hungary competition. The German competition in Canada is stated to be pretty keen in Canada. At the present moment the Canadian Pulp and Paper Association should prove most useful in handling the local trade prospects through the influence of and by the help of the Dominion Trade Boards. Also, if legislation is wanted, now is the time to move. In London the Paper-Makers' Association and the Board of Trade have had several conferences and consultations, but the results are kept confidential and very rightly so. We do not know what the future has in store.

Toward the end of November the British Wood Pulp Association will meet, but owing to the war it has been decided to have no banquet this year. The function was always a most elaborate affair, and pulp men of all nationalities gathered round the festive board. In the first week of November the Paper Makers' Association will meet to discuss the present state of trade, after which an alfresco dinner will be held. The paper-makers, as a rule, say very little for the information of the outside world—they believe in the old adage, "Silence is Golden." The reporters, however, do not think so.

The question of dyestuff and coloring materials is still a problem amongst the British paper-makers. They are paying heavily for anything they require, and wall-paper men are feeling the position very keenly in the mills, so much so that the output is reduced enormously. Fortunately stocks are fairly heavy.

The Wall-Paper Manufacturers, Ltd., have issued their annual report for the year ending August 31, 1914. It states that the profits for the year amounted to £151,499 17s 3d, and £114,697 have been carried forward to next year's account.

Sir T. Vansittart Bowater, Lord Mayor of London, (head of Bowater and Sons, paper-makers, etc.) retires from office in November. He has made a brilliant Lord Mayor. The other day he entertained to luncheon some of the paper trade journal proprietors, amongst whom was Mr. S. Charles Phillips, owner of the "Papermaker," who has just returned from an exciting and interesting tour in Belgium and France. By the way, Mr. Phillips' son has volunteered for active service and has been given a commission.

British mills are going strongly in favor of electricity and scarcely a month passes by but reports are made that it has been introduced either for power or lighting purposes. Recently there has been quite a rush on electricity.

Mr. O. O. Wrigley, of one of the Bury paper mills, is providing a hospital for wounded soldiers. He has also contributed \$2,400 to the Belgian fund for the relief of distress.

DEPARTMENT OF TRADE AND COMMERCE SEES OPENINGS FOR CANADIAN PULP AND PAPER MAKERS.

The Weekly Report of the Department of Trade and Commerce points out some markets which are open to Canadian manufacturers. Mr. J. W. Ross, Trade Commissioner at Shanghai, China, gives a list of German exports to China, and intimates that the way is now clear for Canadian exports. German paper and cardboard to the value of \$382,500 and wood pulp valued at \$17,591 went into China last year.

Other countries' exports were:—

	Paper.	Pulp.
France	\$ 7,500	.....
Belgium	41,875	.....
Italy	1,875	.....
Austria-Hungary	68,750	.....
Sweden	963,125	.....
Norway	43,153	8,694

The reports adds that the total Chinese imports of paper, cardboard and strawboard in 1913 amounted to about \$4,000,000.

Contracts for wood pulp given to Scandinavian exporters previous to the war cannot be fulfilled and importers of this product are now looking to Canada for their supplies.

The Board of Trade Journal says of the Japanese paper trade:—The total capital of the thirteen companies forming the Association of Japanese Paper Mills is about 30,000,000 yen (£3,062,500), and the number of mills owned by them is twenty. The paper mills which are outside the association number eleven, including the Government Paper Mill and eight strawboard factories. The production of European styles of paper (except strawboard) in 1913 by the associated mills was 295,892,821 pounds.

Imports of paper in 1912 were 79,301,441 pounds, valued at \$3,456,347, and in 1913 83,340,361 pounds, valued at \$3,517,116.

Imports of packing and wrapping paper in 1913 show an increase in value over 1912 and 1911. This increase may be accounted for by the fact that the manufacture of such paper in the home mills does not keep pace with the growing demand all over the country for wrapping paper.

Although for several years the paper trade of Japan had been dull partly owing to the keen competition of foreign goods, at the commencement of 1913 the market began to show signs of improvement owing to the active demand for the products of the home mills. It was realized that their capacity was getting inadequate for the growing demand and consequently several companies decided to extend their plants, some of which have already been completed. A sudden setback, however, was experienced in the summer of 1913 and towards the end of the year all the mills were more or less overstocked in all lines except newspaper.

The following inquiries have been received:—

1109. Wood pulp.—A correspondent in Spain reports a demand in that country for Canadian wood pulp, in consequence of the suspension of Swedish supplies.

1125. Pulp.—A Japanese importing firm wishes to get in touch with exporters of Canadian pulp.

In writing to the Department in reference to the above, correspondents should quote number.

SWEDISH PULP SITUATION.

"Affarsvarlden," Sweden, says, October 21:—

Mechanical Pulp.—We are informed that the reduction of the output on account of the water-famine is estimated at about 130 tons of dry pulp and about 600 tons of wet pulp per day, including such output at the paper-mills, which is for consumption at their own mill. From all parts of the country, excluding Norrland, a very low water-level is reported and prospects for the winter are indeed very bad.

Chemical Pulp.—It has now been confirmed that the stocks at the cellulose-mills in this country are very small, they are indeed very much smaller than at this time of last year, for sulphite as well as sulphate. On account of the large sales for prompt delivery which have been made since the war, the unsold quantity for delivery during the present year is also very small, the statistical position therefore is very favorable for the sellers. Prices are unchanged and firm.

HONORED BY STAFF.

On the occasion of his recent marriage to Miss Elizabeth Cornelia Van Vliet, third daughter of the late W. H. Van Vliet of Lacvolle, Que., Frederick J. Campbell, general manager of the Canada Paper Co., Windsor Mills, Que., was presented by the staffs of the Toronto and Montreal warehouses and by the mechanical and office staff at the mills, with a handsome Royal Windsor china set, accompanied by a congratulatory address.

REID CASE IS CONTINUED.

The enquete in the case of R. H. Reid, of New York State, who is charged with obtaining by false pretence 7,500 shares of the Labrador Pulp and Lumber Company, is being continued before Judge St. Cyr in Montreal. The charge against Reid, who is a member of the Montreal Stock Exchange and prominent in local financial circles, is laid by John McMartin, of Cornwall, Ontario; and of Montreal, who alleges that on or about the first day of April, 1909, Robert Reid, contractor, obtained with intent to defraud by false pretences, from the Labrador Pulp and Lumber Company, Limited, seven thousand five hundred shares of the common stock of that company, totalling in value \$750,000. Mr. McMartin swore to the complaint before Mr. Coriveau, the clerk of the Crown and Peace.

A sensation was caused by the fact that Reid, while out on \$40,000 bail, was re-arrested on information received at detective headquarters from Chief of Police John A. Rodland of Halifax that the accused was wanted at that city on a charge of dealing with a forged document knowing the same to be forged.

PAPER TRADE IN THE WEST.

John Martin, of the John Martin Paper Co., Winnipeg, which has branches in Calgary and Edmonton, has been paying a visit to the trade in Toronto, Montreal, Holyoke and other eastern centres. Recently he celebrated the twenty-fifth anniversary of his advent in the paper industry. Mr. Martin makes trips twice a year to the various firms that he represents in order to keep closely in touch with manufacturing conditions, new lines, output, etc. He reports that business in the west in the paper line is rather quiet at the present time but, during the past few weeks, has greatly improved. He looks for a decided betterment in the spring.



NEW PATENTS

BEATING-ENGINE AND EXTRACTING APPARATUS FOR MAKING CELLULOSE.

BURDETT LOOMIS, of Hartford, Conn., Patentee.

Patented August 25, 1914.

According to the inventor's description, this invention relates to a closed beating engine and connecting apparatus for digesting woody material and plants to make cellulose, and preparing finished paper stock directly in the engine; also for saving extracted natural constituents such as tannic acid, fatty acids, volatile and other oils, gums, and resins, and re-using fatty acids and other solvents in a subsequent operation.

The principal object of my invention is to provide an improved construction of beating engine, in which woody and other fibrous material may be reduced to pulp or cellulose under pressure, and in which the material may be caused to circulate while subjected to the action of a beating drum and blades till a washed, clean and bleached cellulose is prepared ready for paper making.

Another object is to provide special means in a closed digester and beating engine, for causing a forced circulation of extracting and dissolving liquor and fibrous material or pulp, whereby every part of the fibrous material may be repeatedly subjected to the action of the beating drum and blades, and the mass of material agitated for facilitating the extraction and removal of oils, gums and resinous matter.

Another object is to provide an apparatus, including a closed beating engine and extractor for circulating hot water or solvent liquor, reheating such water or liquor, separating and storing watery extracts, such as tannic and other acids, volatile and other oils, and resinous and gummy matter from wood and plants whereby great economy may be effected and improved products obtained.

Different kinds of wood and plants contain a variety of constituents, such as tannic and other acids, gums, wax, turpenes, oils and resinous substances, according to the character or kind of wood or plant, which substances are not useful or desirable in cellulose for making paper, in fact, detrimental thereto,—but which, if separated from the wood and from one another, are quite valuable for use in the arts, and which when separated, leave the fiber of wood or plants in the cleanest and best condition for making superior pulp or cellulose, with a reduced expenditure of time and labor and a reduced percentum of chemicals, heretofore required for that purpose.

My apparatus is especially adapted for extracting and separating the various useful constituents and utilizing them as far as possible in making cellulose.

The matter constituting my invention will be defined in the claims.

I will now describe my apparatus by reference to the accompanying drawing, in which—

Figure 1 represents a sectional elevation of a closed beating engine, and extractor constructed in accordance with my invention. Fig. 2 represents a sectional elevation of a beating engine and connecting appara-

tus for separating and collecting extracted material, a reheater for solvent liquor, a gas heater and connections, and other devices for collecting and saving useful products.

In the apparatus I provide seven principal parts or devices consisting of a beating engine and extractor 1, an expansion and depositing chamber 30—30a, heating coils 36 located in a furnace below the bottom of engine 1; a condenser 32, a gas heating coil 44 in a furnace, a gas force pump 62, and a disintegrator tank 68, these parts being suitably connected by valved pipes, and a circulating force pump being connected by valved pipes, and a circulating force pump being connected in the system.

The closed circulating and beating engine 1, may be constructed of cast iron or other suitable metal, and has four principal body portions, consisting of the lower transverse horizontal body 2—2b, and connections 3—4a, an upper inclined conveyer pipe or trunk 4, and an upright end 5, suitably connected together to form a circulating chamber for fibre-material and treating liquor or water. To one end of the drum-chamber 2a is connected a T 2b, having an opening and a cover plate a for permitting inspection, or for other desired purpose. To the other end of chamber 2r is connected a corner T a, having a blow off or discharge pipe 3a. To this T is connected an upper cross 4a, which in turn is connected to the inclined transverse conveyer pipe or trunk 4. These castings are bolted together at their flanges. The cross casting 4a has a top opening which is closed by a cover plate 4b, also an outer end opening which is closed by the thrust plate 4c, having a socket 15, containing a thrust collar and washer, for the end of shaft 13. To the trunk 4, is connected an angle cross casting 6, to which is also connected the top mouthpiece 6a and the upright pipe connection 5, which connects at its lower end with the lower corner T connection 5a, which has a supporting web 5b. The upper flanged end of the mouthpiece is provided with a circular groove for receiving the cover 7, which is provided with a circular rib to make a tight joint with said groove. The cover will be secured in place by bolts 7a and is provided with a screw-eye 7b. The casting 6 is provided with a circular shoulder 6b within the mouthpiece 6a, for supporting a perforated screen plate or sieve 10. To the cover 7 is secured a pipe or rod 9, having a flange at its lower end, to which is connected the plate 10, so that the said plate may be removed with the cover. The mouthpiece is provided with a discharge pipe connection 8, connecting with a discharge pipe 8a, which connects with the expansion and depositing chamber 30 and is provided with a valve b.

In the pipe or trunk 4 is placed a screw conveyer 12, having a shaft 13 resting at its lower end in the socket 15, and passing at its upper end through a stuffing box and plate 14. In practice a belt wheel or any suitable gear wheel will be secured to shaft 13 for turning the screw-conveyer.

The corner casting 5a is provided with a pipe connection 16 for the return circulating pipe 39 leading from the top of the heating coil. Within the casting 5a is extended an injecting pipe 17, as a continuation

of the return pipe 39. This serves as one of the means for causing a forced circulation through the beating engine.

In the chamber 2a is mounted a beating drum 18 on a shaft 19 in a journal box 20 in a well known manner. Below the drum, in a suitable casing is placed an adjustable bed plate 21, having the usual knives or blades, and made adjustable toward or from the drum by special adjusting mechanism 22 in a casing 23. A clean-out door 24 is provided in the lower part of the drum chamber. The upper wall of the drum chamber 2a is suitably curved to conform approximately to the curve of the drum, but so as to approach it closer at the upper corner 2c of the chamber. The drum will revolve in the direction of the arrows. The opening between the upper wall and the drum is flaring from the narrow slit 2c to the wide opening 2d. The construction of the upper wall serves to prevent most of the fibre material from circulating around with the drum.

To the mouthpiece 6a is connected a water and vapor discharge pipe 8a, having a valve b, which connects with an expansion and depositing chamber, 30—30a, at the top of which connects a vapor discharge pipe 31, having a valve c, leading to a condenser 32.

The expansion and depositing chamber 30—30a is of a suitable height and diameter to provide for expansion of the vapors and partial cooling of the liquor to facilitate deposit of resinous or gummy material. At the lower end the chamber is made with tapering walls terminating with a discharge pipe having a valve g for drawing off gummy or resinous matter.

A steam coil 38 is placed in the lower end of the depositing chamber for melting gummy or resinous material in case it becomes cold and hardened. At about the middle height of chamber 30—30a is placed a separating dome or hood 33 which may be attached at its edges to the wall of the chamber, as shown in Fig. 2. In this construction the outlet pipe 34 connects with the wall of chamber 30a at the top of the dome and is provided with a valve e. The dome 33 is located below the connection of the water and vapor discharge pipe 8a from the engine and extractor 1 and provides a vapor expansion chamber or space 30 above it, and a depositing or catch-all chamber or space 30a below it. This dome acts as a deflector and separator to cause the rosin or gummy matter to be deposited in the bottom of the chamber while the water or treating liquor flows up into the dome and thence off to the circulating pump 35. A positively acting rotary pressure pump 35 is preferably used, though some other kind of positive pressure pump may be employed. A discharge pipe 35a connects with the pump and leads to the lower end of a series of heating coils 36 suitably supported in a furnace 37. These coils are connected in a series by means of return bends h which extend through the wall of the furnace. Near the bottom of the furnace is provided a perforated arch 37a for distributing the gas flame and protecting the lower heating coil. A fire chamber is provided below the arch 37a. Gas is preferably burned in the fire chamber and is supplied by a pipe 40 having a valve k' and a burner k of any suitably kind in the fire chamber.

In order to secure satisfactory heating and circulation of treating liquid through the apparatus, the heater is located so that the top thereof is below the bottom of the engine and extractor 1.

To the top of the heating coil is connected a return pipe 39 of the circulating system, and this pipe is also

connected to the pipe connection 16 at the bottom of the engine 1. The pipe 39 is provided with a check valve f. A check valve f is also placed in the lower end of pipe 35a at its connection with the coil. These check valves prevent back flow of water from the engine. A water supply pipe 41, having a valve l connects with the mouthpiece or may connect at other desired part of the apparatus.

A second heating furnace 42, containing a gas heating coil 44 is provided for heating gas to be used, if necessary, in drying the contents of the beating engine after a material has been treated with a solvent solution. A gas supply pipe 43, having a valve n supplies a burner o in the furnace. A gas supply pipe 45, leading from a gasholder 46, and having a valve p connects with the heating coil 44. A pipe 47 leads from the coil into the lower part of the engine 1, and is provided with a valve q. An outlet pipe 50, having a valve t, connects with the mouthpiece 6a, and leads to a second condenser 56 from which a pipe 57 leads to a rotary exhauster 58. The condenser is provided with a draw-off pipe and valve w. A pipe 59, having a valve r leads from the exhauster and connects with the pipe 47a, connecting with pipe 45. A branch pipe 60, having a valve x connects pipe 59 with the holder. Gas drawn from the engine and extractor may thus be returned either directly to the heating coil or to the holder. Cold gas may also be passed from the holder through pipe 47a, having a valve p', into the beating engine.

A compression pump 62 may be used to draw gas directly from the holder 46 through pipe 66, or hot gas from the heater through pipes 66, 66a and 47, and discharge it through pipe 63, and branch 64 in the top of an elevated feed tank 61, for holding alkaline chemical or bleaching liquor. The pipe 66a has a valve c''. A pipe 62a, having a valve z connects tank 61 with pipe 50 leading to the mouthpiece 6a of the engine. The tank 61 is provided with a cover y and its supply pipe 64 is provided with a valve a'. A branch pipe 65, having a valve b' connects with a pipe 63 and with the mouthpiece 6a for admitting gas under pressure directly to the beating engine when required for blowing out the cellulose or other contents.

To pipe 39, leading from the heating coil 36 is connected a blow-off pipe 52, having a valve s and connecting with a storage and settling tank 51. To pipe 39 is also connected a draw-off pipe 53, which connects by a branch pipe and valve s' with a tank 54 and by a second branch pipe and valve t with another tank 55. These tanks 54—55 are provided respectively with faucets u and v.

A pulp receiving and disintegrating tank 68, is connected by a blowoff pipe 3a having a valve l' to the discharge pipe at the bottom of the engine and extractor 1, and is provided in its top plate with a target 69 against which the pulp is blown for separating and disintegrating it. The tank is also provided at the top with a purge pipe 70 having a valve 71 for the escape of vapors. Across the lower end of tank 68, about one-fourth of its height from the bottom, is secured a grid and filter cloth 72, providing a compartment 73 below for receiving liquor and to the bottom is connected a drain pipe 74, having a valve d', for discharging the liquor. A pipe 75 connects with the bottom of the tank and extends up into compartment 73 where its upper end is provided with a plug 76, and this pipe serves for discharging the pulp after having been drained. A gas pipe 65a, having a valve

e', leads from a compression pump 62 and connects with tank 68 just above the pulp discharging nozzle 1'' for supplying gas under pressure to carry off much of the watery vapor at the time the pulp is blown against the target 69, so that much of the black liquor, which would otherwise settle with the pulp onto the filter cloth, will be taken up and carried off with the gas. As a result of this operation there is left less liquor to wash out of the cellulose and, therefore, the cellulose will be much cleaner when removed from the tank. The purge pipe 70 will preferably connect by pipe 77 having valve h' with a condenser 78 for separating water or any other condensable matter from the gas. The gas, freed from condensable matter, will be returned to the holder or to a heater.

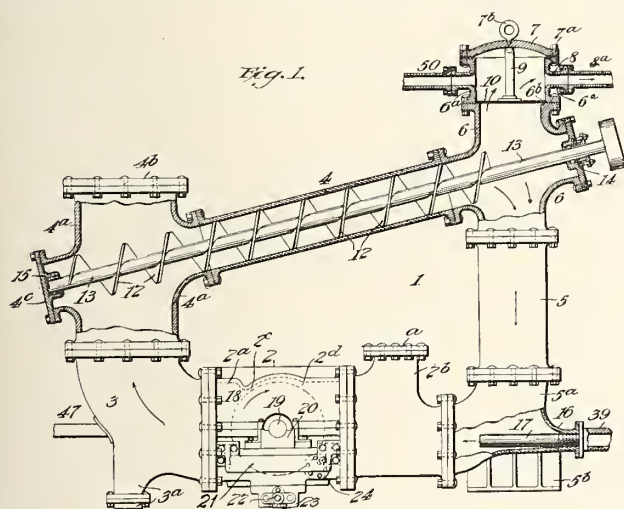
By constructing the heating engine and extractor as shown in Fig. 1, I provide for effectively circulating the fibre material and solvent, or other treating liquor, grinding action of the drum and blades of the bed and repeatedly subjecting them to the beating and plate. Four parts or devices are provided for aiding circulation, consisting of the revolving drum 18, the inclined screw conveyer 12, in pipe 4, the down-take pipe 5, in which the weight of material aids by gravity; and the injecting pipe 17 leading from pipe 39 and the force pump 35. These parts work harmoniously together, and if the drum is stopped the other parts

fatty acids, gases and other products of decomposition when diffused in hot water are an excellent solvent for the cellular structure, the gummy and resinous material found in wood and plants, and that, if the mixture or solution is circulated in contact with the wood or plants to be treated the contained resinous matter, oils, and turpentine or other volatile oil will be quickly liberated and may be drawn off with circulating water. The turpentine and more volatile oil will pass off in the form of vapor and will be condensed, and the rosin and gum will pass off in a melted semi-liquid condition, and will be deposited and recovered. I have also discovered that the fatty acids and other solvents may be most effectively and economically produced and diffused in water by first heating fresh water and circulating it in contact with the wood, or plants to be treated at gradually increasing temperatures, ranging from 212 deg. to approximately 300 deg. F. The volatile solvent is readily extracted from the wood or plants and diffused in the water and the mixture is passed from the engine and extractor through a heater where the temperature is raised and is then circulated up through the wood or plants, in the engine and extractor. The circulation of the water and solvent in contact with the wood or plants and through the heater, the temperature being gradually increased, is continued till the solvent has liberated the turpentine, oil, resinous and gummy matter and these valuable products have been recovered. The treatment may be continued for six to twelve hours, according to the character of the wood or plants and the temperature of the treating liquor.

In the operation of preparing fatty acid solvent from the wood or other fibre material, hot gas, such as wood-gas or producer-gas, heated to a temperature between 200 deg. F. and 300 deg. F. in the coil 44, may be admitted to the engine and extractor through pipe 47 and circulated alone or with a suitable proportion of water through and in contact with the fibre material. By means of this circulating warm or hot gas for some time,—thirty to ninety minutes—in contact with the fibre material the fatty acids, gases and other solvents will be extracted and formed from the wood and mixed with the water or other liquor. At the time the warm or hot gas is circulated, the volatile extract is preferably not drawn off and condensed, but is retained in the circulating fluid for its solvent action on the cellular structure and on the gummy and resinous matter. The extraction of fatty acids and other solvents by gas is rapid and is quite effective in connection with circulated water, when conducted substantially as above described.

I preferably first remove tannic acid from the wood or plant material, as it can be extracted at low temperature, between 120 deg. and 170 deg. F., and if left in the wood during the pulping operation, combines with the fibre, imparting thereto a dark color, and cannot then be washed out with water alone, but must be removed by alkali and bleaching agents, entailing additional expense.

In operating the apparatus, the engine and extractor 1, is partially filled with chips of wood or cut fibrous plant material through the mouthpiece 6a, at which time the cover 7, and screen 10, will be removed. The screen plate 10, will be attached to the flange of pipe 9, so that the screen may be removed with the cover. After the engine is suitably charged the cover will be secured in place by the bolts 7a. The whole system is now filled with water or a solvent liquor admitted by pipe 41 and caused to rise to the level of the discharge pipe 8a, at its connection with the expansion chamber



would still act to circulate the treating liquor through the fibre material for extracting tannic and fatty acids, volatile oil, other oil, gums, resins, etc., or for circulating a washing or bleaching liquid through the material.

By heating wood to a moderate temperature, ranging between 215 deg. and 245 deg. F., decomposition is set up, resulting in the formation of a number of acids of the fatty acid series and by raising the temperature there are formed other fatty acids. The formation of fatty acids, among which acetic acid appears in largest quantity, commences, according to Gillot at 255 deg. F. Other fatty acids are formed, such as formic acid, propionic acid, butyric acid, valeric acid, etc., at the above and higher temperatures. Simultaneously with the formation of these acids, carbonic acid, carbonic oxide and methane are evolved from the wood, and these bodies in a nascent state may act upon the acids so that the latter may undergo decomposition by more vigorous beating and a large number of products of decomposition may be formed. Among such products are found methyl alcohol (wood spirits), acetone and metacetone, methyl acetic ether, aldehyde and dimethyl acetal. I have discovered that these above-mentioned

30. Gas may now be admitted to, and ignited at the burners *k'* below the coils, and the circulating force pump 35 is started. This causes circulation of water being injected through pipe 17, for causing better circulation through the engine and extractor. The water is circulated at a temperature between 120 deg. F. and 170 deg. F. through the body of chips or plant material for first removing tannic acid. Circulation of water at this low temperature is continued until all, or most of the tannic acid has been extracted, then this acid solution is drawn into a tank 54, by opening the valve *s'* in pipes 53.

The system is again filled with water, or a fatty acid solvent solution made by a previous treatment of wood chips, and the pump 35 again put in motion, and the heat may be gradually increased in the furnace 37. As the circulating water becomes heated, approximately to 212 deg. F., some of the fatty acids are produced and passed with the water into the heating coils. As the temperature of the water is gradually increased other fatty acids, gases, and products of decomposition are formed and diffused through the water. The hot circulating water and the solvent fatty acids soon commence to dissolve the cellular structure and release turpentine, or volatile oil and gummy or resinous matter from the wood-chips or plants. The turpentine and other volatile oil vapor passed with the water or liquor into chamber 30—30a, where the volatile vapors separate and fill the upper part of chamber 30, from which they pass off through pipes 31, to the condenser 32, where condensation is effected. At the same time the resin or gum which has been released from the wood or plant material is passed with the water down past the separating dome 33, and the resin or gum is deposited in the lower part of chamber 30a, while the water passes up through the dome 33, and thence by pipe 34, the pump 35 and pipe 35a into the bottom of the heating coils 36, and thence through pipe 39 into the bottom of the engine.

By circulating the hot water up through the body of material in the engine the resinous gummy matter is carried upward and floated off with the water through pipe 8a into the expansion and depositing chamber 30—30a.

The circulating hot water or solvent liquor agitates the body of chips or plant material and prevents packing, and continuously carries away the extracted material so as to continuously bring fresh liquor into contact with the chips, thereby effectively exerting its solvent action on the cellular structure so as to release the gummy and resinous constituents. In the expansion and depositing chamber 30—30a the liquor is partially cooled and quieted, so that the rosin or gum becomes hardened and will readily settle to the bottom of chamber 30a.

The temperature of the water or liquor may be gradually raised in the heating coils to approximately 300 deg. F., and it will become charged with an increasing percentage of fatty acids, gases, etc., and these act with increasing energy to dissolve, release and extract the turpentine, oil, resinous and other gummy matter from the material until it is substantially free from such constituents. The operation may be continued for a period varying from 6 to 12 hours, according to the character of the wood or plant being treated.

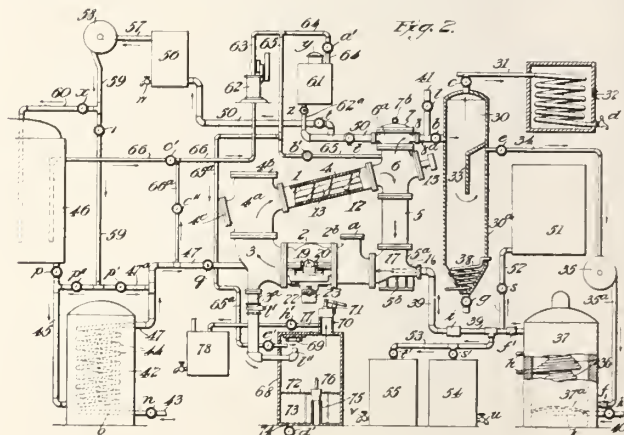
During the above described operation of extracting constituents from the fibre material the screw conveyor 12, may be operated to assist circulation and agitation of material in the engine. The pump 35 will also operate to force liquor through the heater and

thence through the injector pipe 17, thereby causing circulation thereof through the fibre material and up to the overflow pipe 8—8a leading from the mouth-piece to the expansion and depositing chamber 30—30a.

At suitable intervals, the valve *g* may be opened and the resinous or gummy matter discharged from the chamber 30a, but this may be mostly discharged at the end of the operation.

At any suitable stage in the operation, when the chip or plant material has become sufficiently softened and partially freed from gummy or resinous material the beating drum 18 may be set in motion and the material subjected to beating, rubbing and grinding while at the same time the hot solvent liquor is circulated through the engine.

When treatment of the material in the engine is completed, the valve *b* in pipe 8a may be closed and the blow off valve *s* opened, permitting the water or liquor containing the fatty acid to be blown off into the storage and settling tank 51, where it is reserved for treating a succeeding charge of fibre material in the engine and extractor. This blowing off operation may be facilitated by admitting compressed gas from pump 62 through pipe 65 into the top of the engine. The wood chips or other fibrous material in the treating engine will now be practically free from gum, resin, and oily matter, and the pores will be open so as to be readily permeated by caustic-soda or other solution.



The cleaned fibrous material may be conveniently reduced to cellulose directly in the engine, which now becomes a digester and beating engine, by admitting fresh water through pipe 41 and the desired per cent of caustic soda solution of sulphite of soda from tank 61. The beater drum 18, and the circulating devices will be put into operation at the desired stage of the process. The circulating pump 35 will be put into operation and the liquor caused to circulate in the direction of the arrows through the heater 36 and up through the material till digestion and reduction to pulp or cellulose is completed. The temperature may be raised to 250 deg. F., or higher if required, and at intervals more alkaline solution admitted from tank 61. Gas under pressure may be admitted by pipe 64 into the top of tank 61 for forcing the alkaline solution into the engine. Owing to the preliminary thorough preparation of the chips, or fibre material the percentage of caustic soda, sulphite of soda or other chemical used for digesting the fibrous material, will be very much smaller than that required in the ordinary process. The heat and pressure will be much lower, and the time will be much reduced for reducing the material to a good strong fibre pulp or cellulose.

The cellulose prepared as above described, freed from gums and resins, will be bleached to the desired extent with a comparatively small per cent of chloride of lime or other bleaching agent and thus great economy effected, while the cellulose will have greatly increased strength of fibre. The low heat and pressure employed in the digester also contribute to the strength of fibre. The low heat and pressure employed in the digester also contribute to the strength of the fibre in the cellulose.

Owing to the reduced amount of caustic soda and the shorter time required in digesting the prepared chips the fibre of the cellulose will have greater strength than that produced in the usual way.

After reduction the fibrous material, by digestion with alkali or alkaline salt, to pulp or cellulose, has been completed, that is cooked in the engine, I may draw off the alkaline liquor through pipe 3a, and admit fresh warm or cold water through pipe 41 to the digester and engine and circulate such water repeatedly through the cellulose by means of pump 35 and conveyer 12 for washing out the alkali and dissolved or saponified oily or resinous matter. The first wash liquor may be drawn off and fresh water again admitted and circulated till the cellulose is sufficiently clean. The finished cellulose may be blown off through pipe 3a to the disintegrating tank 68.

The cellulose having been produced, gas under pressure is supplied from pump 62 through pipe 65 to the top of the engine and then valve 1' is opened and the cellulose is discharged through blow-off pipe 3a and nozzle 1'' against the target 69 in the top of tank 68. Here the particles which adhere together will be disintegrated and separated. At the same time gas under pressure will be admitted through pipe 65, just above the discharge nozzle 1'', so as to catch the spray of liquor, containing coloring matter and some residue of gummy matter, and carry it out through the purge pipe 70. The top valve 71 may be open, so as to blow the gas and vapors into the open air, but said valve will preferably be closed and the gas and vapors conducted by pipe 77, its valve f' being open, to a condenser 78, where the liquor vapor will be condensed, while the gas will be freed and returned to the holder, or to a heater to be again heated and then compressed to be used over again for blowing out colored liquor vapor. Any liquor which drains from the pulp through the filter cloth 72 will be drawn off from compartment 73 as required. The pulp or cellulose may be discharged from tank 68 by opening valve 76 in pipe 75, into a bleaching or other tank.

By first extracting and removing the tannic acid from the wood, I prevent discoloration of the cellulose. The tannic acid is left in the treating tank combines with the fibre and becomes fixed so that it cannot be removed by ordinary washing, but must be removed by chemical treatment, entailing additional expense for chemicals and requiring additional time for treatment.

Strength, toughness and elasticity are characteristic of the fibre in the cellulose produced by my process.

LINER FOR WOOD-PULP DIGESTERS.

GEORGE ERNEST MILLER, Madison, Me., Patentee
—Patented in U. S. Patent Office, September 1, 1914.

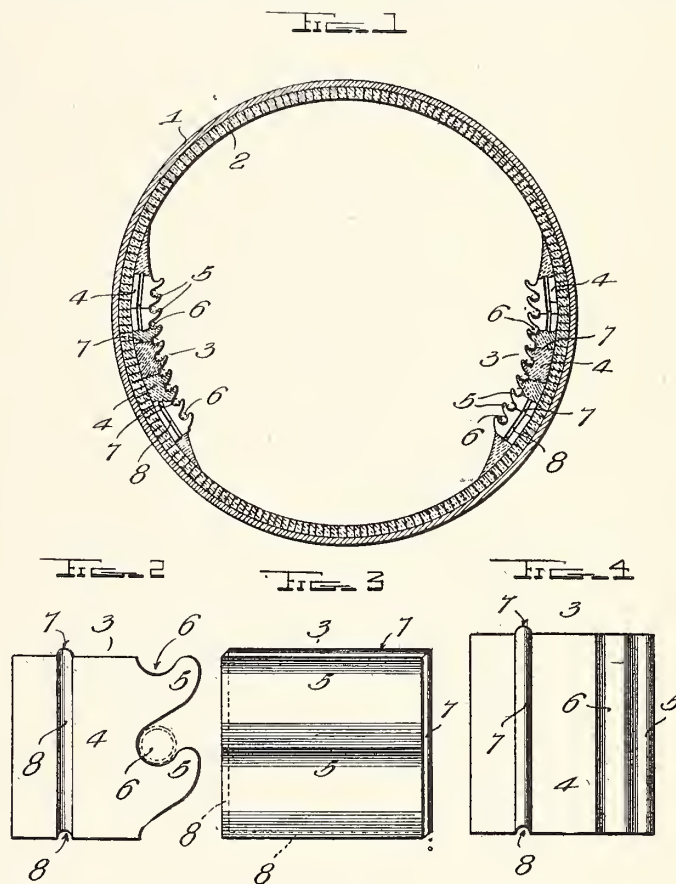
The inventor says: My invention relates primarily to digesters for cooking wood or other material used for making pulp, but more especially to the lining of the same.

One object of my invention is to provide an acid-proof lining for this class of digesters, having integ-

rally formed acid-proof pipe supports whereby the steam pipes or coils of the digester may be securely supported on the inner sides of the latter, the supporting means being unaffected by the acids used in the process of digestion.

Another object of the same is to provide a lining of this class which is inexpensive, easily constructed and that can be readily replaced when worn.

With these and other objects in view my invention consists of certain novel features of construction and combination and arrangement of parts which will hereinafter be more particularly pointed out and claimed.



In the accompanying drawings in which similar parts are designated by like characters Figure 1 is a transverse vertical section of an ordinary annular wood pulp digester, illustrating my improved lining and pipe support interiorly arranged on opposite sides thereof, some of the pipe supporting members being here shown in section and others partly in section; Fig. 2 is a side elevation of one of my improved liner and pipe supports illustrating the bead receiving channel formed therein; Fig. 3 is a front elevation showing the curved pipe supporting projection formed on the face of the liner; Fig. 4 is a plan view illustrating the locking bead carried by my improved liner and support.

Heretofore it has been customary in this particular art to support the steam pipes passing through the digester on the sides of the latter by means of bronze plates, but usage has disclosed the fact that these plates soon become corroded and finally destroyed, owing to the destructive effect of the acid used in the process, permitting the pipes to become displaced and fall into the bottom of the digester, with the result that a good deal of steam escapes into the pulp, damaging the quality of the same and much time is lost in replacing and repairing the coils, all of which means a great loss of production. And it is to overcome these

objectionable features that I propose to line the digester with acid-proof members having integrally formed hooks which retain the pipes in place.

Referring more particularly to the drawings, 1 denotes the cylindrical metallic casing of an ordinary digester, although I do not limit myself to this particular form of the same. Formed around the inner surface of the casing 1 is the usual brick lining 2 which protects the casing against the destructive action of the acids used in preparing the wood pulp.

Over a portion of the brick lining 2, on each side of the digester as clearly shown in Fig. 1 I propose to place my improved lining the individual members 3 of which consists of the acid-proof base 4. Formed on the upper surface of the latter are the longitudinally extending hook-shaped projections 5, the curved surface of which coats with the upper surface of the base and with the adjacent member to form the concave shaped sockets 6 which latter makes a perfect receptacle for the pipes used in digesting.

To properly retain the members 3 in position within the digester I provide two sides of the former with a centrally disposed and longitudinally extending bead 7, while in the remaining sides I form a similarly disposed channel 8. By this arrangement it will be seen that when my improved lining has been placed in position the bead 7 on the one member will fit snugly within the channel 8 of the other, thus forming a tongue and groove connection for the same. Of course, it will be understood that in some instances it may be desirable to cover the entire inner surface of the digester with my improved lining, in which case I would discontinue the use of the lining 2, and replace the same with my improved lining and pipe support cementing the tongue 7 within the groove 8 so as to prevent any of the acid from seeping through the lining and attacking the metallic casing.

From the foregoing it will be seen that when the individual members comprising my improved lining have been placed in position, the hook-shaped projections thereon will extend toward the center of the digester and form substantial acid-proof supports for the steam pipes avoiding the necessity of metallic supports, thus making it impossible for pipes to be displaced by reason of the destructive action of the acids used in the process.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Pulp Wood for Pit Props

(Special to Pulp and Paper Magazine.)

Recently, owing to the war in Europe, quite a demand for pulp wood for use as pit-props has sprung up in Canada, and British colliery owners have sent their representations over here to enquire into sources of supply and prices. Hitherto these pit props have been obtained from the Baltic and Gulf of Bothnia ports, but as shipments have temporarily ceased owing to the war, and Canada seems the only available source of supply enquiries regarding them are being made all over the East in Quebec, New Brunswick and Nova Scotia.

Pit props can be of any kind of wood of the pine family, such as larch, spruce, fir and pine. They vary in size from 3 to 7 or 8 inches in diameter and from 4 to 10 feet in length. It is not necessary to free them from outer bark by hand peeling, though in nearly all cases

those from the Baltic were so treated, but the ends should be cut square across and each stick be straight. They are bought at so much per running foot of per cubic fathom. A cubic fathom consists of a pile of logs 6 feet cube or 216 cubic feet, the logs being laid side by side and closely packed together.

Obviously a cubic fathom or 216 cubic feet corresponds to 1.76 cords of 128 cubic feet, and by actual survey measurement to 1,000 superficial feet board measure. It may therefore be taken as substantially true that one cubic fathom of pit-props correspond to that quantity of logs which when sawn will yield 1,000 super. ft. one inch boarding.

According to the observations of the late Mr. H. M. Price, of Quebec, the number of round logs of different diameters required to make up a cord or a cubic fathom were found to be as follows:—

Diameter Inches.	Pieces per cord of 128 c. ft.	Pieces per c. fathom of 216 c. ft.
4¾	87	153
5½	61	107
6 1-5	50	88
7 1-10	41	72

We understand the Provincial Governments have made certain concessions in respect to their restrictive laws in regard to the export of this small timber as pit-props, in order to help out the British colliery owners in their present plight, but whilst it is true the cost of such wood f.o.b. Canadian ports is not too dear, having regard to the prevailing average prices of pulp wood in Quebec, New Brunswick and Nova Scotia, it is equally true that the cost of freight is high and suitable tonnage almost unattainable. Freights from the Baltic to United Kingdom east coast ports on pit-props average from 24 to 26 shilling per cubic fathom (216 cubic feet) whereas from this side present season freights on sawn lumber average in the neighborhood of 40 shillings per standard, which corresponds to 165 cubic feet ship's space. The freight on a cubic fathom of closely piled round wood reckoned on this basis, would rise to 53 shillings. Eliminating the elements of insurance, etc., it would appear that the cost of pit props f.o.b. U.K. ports should figure out in the neighborhood of 93 shillings per cubic fathom, assuming the cost of the props to be 40 shillings per cubic fathom f.o.b. at shipping point. The fluctuation in price obviously greatly depends on the rate of ocean freight and as much of this trade from the Baltic is carried in sailing vessels, by employing the same type of ship for transport from Canada, the foregoing figure might be reduced.

We are of opinion that this business cannot become a permanent one to Canada, on account of the high cost of delivering the goods. When the war is over shipments of pit-timber from the Baltic will be resumed as this is unquestionably the cheapest source of supply for the British market. The present demand in Canada, although of a temporary nature, will give timber limit holders an opportunity of thinning out their forests and of utilizing the best of the tree tops and in this way may serve a useful end.

Winding up orders have been granted in the case of the Long Lake Lumber Company, of Toronto, which had a capital stock of forty thousand dollars and also in La Compagnie de Publication la Justice, Limited, of Ottawa, with a capitay stock of twenty-five thousand dollars.

PULP AND PAPER NEWS

Major Joseph Kilgour, who is president of the Canada Paper Company, and also a member of the firm of Kilgour Bros., Paper Bag Manufacturers, Toronto, resides at Sunnybrook Farm, Eglinton, and this season again placed his property at the disposal of the Ontario Provincial Plowman's Association for the holding of their annual competition. Thirty-three teams were entered in the various matches and about two thousand persons were in attendance on November 6. Major Kilgour and wife served a hot dinner in the evening to some seven hundred guests and Mrs. Kilgour was presented with \$118, the gift of the assembled plowmen and their friends as a contribution to the private hospital for wounded soldiers at Folkstone, which is conducted by her sister, Miss Grand.

The annual meeting of the Spanish River Pulp and Paper Company, which closed its financial year on June 30 last, will be held shortly, word being awaited from the English shareholders regarding the exact date. As all the mills of the company have been working to capacity for some months, it is expected that the financial showing will be a very satisfactory one.

At a meeting of the Canadian section of the Society of Chemical Industry, held last week in Toronto speakers strongly urged a greater degree of co-ordination between the Government and educational institutions and between the manufacturer and the technical chemist as a means of advancing the chemical industry in Canada. T. H. Wardleworth, of Montreal, said that Canada should enjoy the entrance of free alcohol for technical purposes, and added that, as a result of the refusal of the British Government to admit alcohol free to the dye industries of England, Britain had lost the valuable aniline dye business to Germany, which was a great handicap, to paper and leather manufacturers at the present time who could not obtain aniline dyes for their products.

Some time ago the Curtis Publishing Company, of Philadelphia, Pa., publishers of the Ladies' Home Journal, entered action against the Canadian Women's Magazine Publishing Company, of Toronto, to restrain the Canadian Company from using the word "Ladies" in the "Canadian Ladies Home Journal," which name it is alleged, infringed on the Philadelphia publication. An amicable agreement has been reached between the two concerns whereby the Canadian firm will not make use of the word "Ladies." A consent judgement was granted to this effect last week.

Word received from the Pacific Coast indicates that the pulp and paper mills in that province are very busy. The Powell River Pulp and Paper Co., at Powell River, B. C., have three news print machines at work turning out about one hundred and fifty tons per day all told and a ready market is obtained for the entire output. Further extensions are being made to the plant. The British Columbia Sulphite Co., at Mill Creek, Howe Sound, is working to capacity and the Ocean Falls Pulp and Paper Company at Ocean Falls, are also operating to the full extent of the plant.

At a recent sale held by the Department of Lands and Forests, Province of Quebec, a number of permits to cut timber in the Lake St. John East district, Matepédia Valley, district of St. Laurent, district of Rimouski, Gaspé West, Bonaventure West, Lake St. John Northwest and Little Rivers limit were sold by public auction. Permits for 1,036 square miles were sold and the average price obtained was \$238 per square mile.

Pulp wood operations along the line of the Timiskaming and Northern Ontario Railway have been extensive this year and it is expected that the tonnage of spruce wood hauled to the mills by the road will be thirty per cent in excess of last year. A lot of pulp wood has been cut by the settlers who are awaiting snow before they can get it out. About one hundred and twenty-five thousand cords will be handled by the railway during the next few months. More settlers than ever are at work clearing the land and the woods force of the Abitibi Power and Paper Co. at Iroquois Falls, will take out some ninety thousand cords of pulp wood this winter.

J. N. Greenshields, K. C., of Montreal, who is President of the Wayagamack pulp and Paper Co., at Baptist Island, which concern is very busy at the present time, owing to foreign importations of kraft paper being shut off due to the war, has started a new regiment to be called the Montreal Home Guards, which are holding regular drills and becoming proficient in shooting.

The Northern Islands Pulpwood Company, Limited, with headquarters at Port Arthur, Ont., which went into liquidation some time ago, will be wound up, an order to this effect having been granted recently in Toronto by Chief Justice Falconbridge. The capital stock of the company was one hundred thousand dollars and its assets consisting of the plant and rights to cut timber on certain concessions amount to about four hundred thousand dollars. Lack of sufficient working capital is given as the cause of the financial difficulties of the firm.

Thomas Darling, who for many years was agent for J. R. Booth, of Ottawa in the northern section of Ontario, died recently at Callender. He has been in the employ of the Booth firm since 1883 and was widely known throughout the entire district.

The Toronto Board of Trade is moving into its new and handsomely fitted up home on the nineteenth and twentieth floors of the new Royal Bank building at the corner of Yonge and King Streets, Toronto. W. P. Gundy, who is managing director of the Kinleith Paper Mills and W. J. Gage and Company is president of the Board, whose quarters will be among the finest of any organization in Canada.

About twenty thousand firms in Ontario have so far filled in the circulars sent out by the Compensation Board of the Workmen's Compensation Act regarding the number of hands employed, wage bill, etc., so that the board may fix the various hazards and assessments of the different groups of industries. The operation of the new act comes into effect on January 1 next.



The Markets

CANADIAN MARKETS

The news print situation remains practically unchanged and contract consumption has been a little larger of late as more advertisements are appearing in the papers. Several leading dailies are pretty nearly back to the normal size, which they were before the war. With the advent of the holiday season and heavier advertising, it is expected that the news print demand will be larger. A number of contracts will expire at the end of the year, but it is not thought there will be any very great increase in price. Low water is still hampering a number of pulp and paper mills, but it is expected that, with the fall rains, conditions will improve.

The export business in news print for the past eight months according to the returns—up to August—show an average of \$1,091,534 per month. This compares with a monthly average of \$948,904 in 1913 and \$474,344 in 1912. In chemical and mechanical pulp there has also been a big increase of late months. The following figures for three months will show how export trade has developed.

	June.	July.	August.
News print—			
1914	\$1,135,283	\$1,149,569	\$1,108,285
1913	874,284	793,898	889,645
Mechanical pulp—			
1914	270,990	604,868	164,942
1913	173,445	251,284	276,171
Chemical pulp—			
1914	347,606	358,170	382,255
1913	121,199	218,302	203,542

There has been a slightly better demand for book papers owing to a publishing house getting out special books for the coming holiday trade, while a number of volumes and pamphlets are being published on the war, and also literature booming the "Made-in-Canada" propaganda. Writing papers are rather quiet and chiefly in requisition in the cheaper grade. No prices have been raised as yet on book, bond or writings, except in some very high class lines, but what the end of the year may show, when contracts for sulphite pulp have to be renewed, will prove interesting. The demand for ground wood is fair and a moderate amount of selling is taking place. The sulphite situation is quieter, owing to the arrival of some large shipments from Scandinavia and prices are a trifle easier.

Wrapping papers are only in fair demand, but values have been pretty well maintained. Paper box factories are active owing to the number of fancy receptacles that are being turned out for Christmas novelties and packing goods. Jobbing houses are inclined to keep stocks of paper down to a rather low amount and are cautious in the matter of placing large orders. Kraft is moving freely at a slightly advanced figure and the sale of general lines of paper has held up better than was expected for the fall. In fact, the paper trade generally has come out of the present stringency, except in a few isolated cases, better than many other lines of industry.

Mixed papers are down, building papers are dull, and in the other branches of paper stock, dealers report a fair amount of business, although the volume has eased off considerably of late and speculative prices have been eliminated:—

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp (at mill), \$16.50 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$47, delivered in Canada.
 Sulphite (unbleached), \$47 to \$49, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 to \$60, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.95, f.o.b. Toronto.
 No. 1 soft white shavings, \$1.90.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.02½ to \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$6.25.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.60.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3½.
 No. 1 burlap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, November 12, 1914.

There has been a continued steady demand for mechanically ground wood pulp in the local market during the interval. Among the inquiries received by some of the large grinders were requests from pulp makers and dealers in the United States and Canada, who presumably have had some difficulty with water conditions, and as a consequence were unable to satisfy the demands of their customers. Prices were firmly maintained by all and the tendency of values is upwards. Second grade pulp has been moved in large quantities at varying prices ranging from \$12 to \$16.50 f.o.b. ground wood mill.

Sulphite was in quiet demand during the week, although importers of German grades were somewhat concerned as to future shipments. Some shipments from Scandinavia arrived in domestic ports and was promptly moved on contract request. Kraft pulp and

unbleached sulphates moved quietly on contract, but prices were fairly firm.

Much interest in the order of the German Government prohibiting the export of all grades of paper stock was shown by local importers. High grade packings of rope bagging and linens come largely from Germany and there was necessarily some feeling at the knowledge of such an order. There have been a number of fairly good-sized consignments of rags received by importers from Germany through Holland during the period immediately succeeding the outbreak of the war and prior to November 1. Rope has eased off in price, and is now quoted about 3½c to 3¾c a pound. Domestic rags are in poor demand and are inclined to be rather scarce.

While there are no accumulations of old papers in New York on account of the fire laws, there is no demand for the stock. Shipments continue steadily under fallen prices. Hard shavings are now valued at about 2¾ cents and soft about 2.10c a pound. Book stock of all grades has fallen in value about \$2 a ton. The most marked easing has been in old Manilas and mixed papers. No. 1 Manilas have been quoted as low as 70 cents a hundred and No. 2 about 40 cents hundredweight. Mixed papers are valued at about 25 cents a hundred and common paper is as low as 15 cents.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2½ to 2½ delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35c delivered.
 Bleached Sulphite, impt., 2.85 to 3.05, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphate, impt., 2.00 to 2.15, ex dock New York.
 Bleached sulphate, impt., 2.80c to 3.00c., ex dock, New York.
 Kraft Pulp, 2.05 to 2.15 ex dock, New York.

The demand for all grades of paper has shown an increase. Business in general is rather spotty, but there is a healthy tone to it. Collections have been in good shape, and show a still better condition at present. Mills have been fairly active during the interval in certain lines, while others reported rather quiet running. Stationers and printers reported a tendency among consumers of writings and bonds, a large falling off in the demand for high grade papers and a large increase in the demand for cheaper grades. The demand for newsprint on contract continues firm and there has been a large increase in the production of news during the past month.

Prices were firmly maintained on the few renewal orders that were taken. Sheets moved steadily at 2.35c f.o.b. New York. The wrapping paper industry reported good running and a fair volume of shipment to current values which are firm. Book manufacturers are running on nearly full time, and have found a fairly active market for their goods in the interval. No change in prices was reported, but it is anticipated by many that the near future will bring some change in favor of the producers. Boards were rather quiet, but prices were firmly maintained. The demand for Manilla and kraft papers was fairly good. Bags and toilet papers enjoyed a good demand

with rather short supplies in the hands of manufacturers. There has been no change in the tissue situation which is still rather quiet as far as business is concerned. The tone is very solid, as manufacturers firmly adhere to the advanced prices now asked. Cigarette papers are rather scarce, and are in good demand. The scarcity of deep colors, such as reds, blues and purples, has brought about a scarcity of some cover papers and specialties. Prices in specialties have advanced sharply during the past few weeks.

Quotations unchanged for all grades of paper:—

Paper.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manilla jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
 Manilla, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47 $\frac{1}{2}$ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine.)

London, November 5, 1914.

There is still a good demand for newsprint in the United Kingdom, and prices are on a lower level—about 2 cents to 3 cents. The position has been greatly relieved owing to the continuous and substantial supplies of wood pulps. It is stated that contracts which Canadian mills were not able to enter into, were fixed at £10 10s (about \$49.20) a ton, which is not much above the price Scandinavian mills charge at present. In fine writing and printing papers there is a fair demand, but not satisfactory enough to mills producing these qualities. Colored papers, of course, are dearer. Wrapping and packing papers are in much request, and the supply appears to be plentiful. The Government contracts placed with the mills in September and October have not been so heavy, but there is still a good deal of paper to be turned out under existing contracts, which most of the mills are participating in. In the British printing trades, work has been revived considerably, particularly in the large establishments, and, of course, this means that a good quality of paper is being daily consumed. The German

and Austrian papers being out of the market gives the domestic manufacturers a better chance. Jobbers in German papers are at a standstill and are likely to be until peace is declared. Very little States paper is arriving here so far. The Dutch are now giving the British market some attention.

* * *

The chemical pulp market is dull after the recent brisk buying. Stocks are plentiful for the present requirements. Easy bleaching soda is scarce in the market and any paper mill that has not a good supply in is called upon to pay heavily for prompt parcels of a small quantity. Prices are near about as follows, c.i.f. British ports.

Bleached sulphite (good quality) \$64.80 to \$72.00.

Easy bleaching (No. 1) \$48.00 to \$50.00.

"News" or strong quality, \$46.00 to \$47.00.

Unbleached soda (No. 1), \$30.80 to \$31.20.

Soda kraft, \$3.80.

* * *

The ground wood market is suffering from inactivity and there is plenty of pulp on hand, large supplies have arrived from Canada and Newfoundland, in addition to the usual contract quantities from Norway. It is rumored that the Swedish mills have disposed of the French and Belgian supplies they have had to retain, owing to the war, which means that they may get good prices for any unsold pulp during the next winter. There is a good demand for dry ground wood and prices are on a higher level. Quotations in London are about as follows:—

Pine 50 per cent moist, \$9.60.

Pine, dry, \$24.00 to \$25.00.

For forward delivery quotations cannot be given. All prices are c.i.f. British ports.

* * *

Esparto is easier in prices, and supplies to hand are very fair. Rags are soaring on a higher level and the supplies are not so good owing to German, French, Belgian and other shipments being cut off. In Manchester there is no market at all for rags. Stocks of waste papers on hand with the dealers are enormous.

* * *

The demand for china clay has slackened. Other fillings are plentiful. Prices all round for fillings are not so high and contracts can be fixed up on a reasonable basis for buyers.

MAINE NOTES.

Bangor, Me., November 10.—The financial difficulties of one of the large paper concerns of this country, which were recently aired in the United States District Court at Portland, Me., are interesting to paper manufacturers of both the United States and Canada.

Judge Hale, of the Federal Court, has just appointed Theodore W. Law, of Portsmouth, N.H., a receiver for the affairs of the Colonial Paper Co., in response to the petition of the Old Colony Trust Co., of Boston, which instituted foreclosure proceedings in consequence of the alleged default of the interest payments on a bond issue of \$1,500,000 made in 1910.

The Colonial Paper Co. about five years ago absorbed the Publishers' Paper Co., an \$8,000,000 corporation in which many of the leading newspaper publishers of the United States were interested, for whom paper was to be manufactured at Portsmouth in one of the largest paper mills in the world. The mill was built at a heavy cost, but never turned out any product.

The company also constructed water power plants in Maine which are now idle.

It controlled about 300,000 h. p. along the Saco River which was to be extensively developed, and power in the State of New Hampshire, and possessed approximately 300,000 acres of land in Maine and New Hampshire.

The Publishers' Paper Co., by a special act of the Maine Legislature in 1905, took over the franchises and property of the Eastern Maine Timber Co., an \$8,000,000 Maine corporation, which was organized earlier that year, to assume the assets and property of the White Mountain Paper Co., a \$25,000,000 corporation for which receivers were appointed back in 1903.

PURIFYING PAPER AND PULP MILL WASTE WATER.

A means of dealing with any waste waters that offer considerable difficulties in their treatment, especially those coming from paper pulp factories, depends on the use of a mixture of hydrated silica and salts of iron and alumina prepared from ordinary clay by igniting it in a vacuum and treating the residue with such small quantities of sulphuric acid and water that the silica is obtained in a soluble form. The iron always present in common clay greatly assists the clarifying action of the soluble silica on the waste lyes, as does the sulphate of alumina also formed.

The novelty of the invention consists in the ignition of the clay (to destroy its organic matter) in a vacuum, otherwise it is difficult to get the silica in a soluble form, and the soluble silica is the main effective agent, the iron sulphate and aluminium sulphate being of secondary although considerable importance.

The details of the manufacture are as follow:—1,000 lb. of the ignited clay is treated with a mixture of 400 lb. of concentrated sulphuric acid and 1,500 lb. of water in the cold with constant stirring for about one hour. It is claimed that the product will clear one thousand times its weight of waste pulp water sufficiently in from ten to fifteen minutes to permit of its discharge into a river. The sediment is collected and reignited for use again.

TRADE NOTES

The Daily Courier, which is the latest venture in the field of Toronto journalism, has reduced its price from two cents to one cent per copy. It is published by the Courier Co. which has issued the Canadian Courier for some years, and is a sixteen to twenty page publication, filled with many pictures of the war and containing general telegraphic and cable news with a summary of local happenings. The Courier is a new shape, four columns wide, and its type pages are 9¾ inches by 12½ inches.

John R. Barber, who is now in the seventy-fourth year of his age, and the dean of the paper trade in Canada, but who retired from active connection with it a little over two years ago, is to-day enjoying better health than he has for some years. It is interesting to note that of several manufacturers who assembled in the city of Hamilton forty years ago last August and formed the nucleus of the Canadian Manufacturers' Association when the National Policy was first favored, Mr. Barber is the only one living. All the others have joined the silent majority, and Mr. Barber, who in the last two or three years has twice been giv-

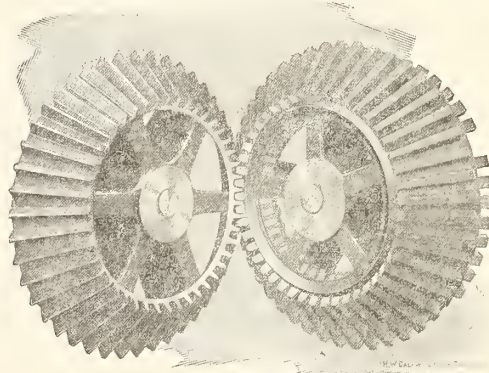
en up by his physicians, is still able to make weekly visits to Toronto from his home in Georgetown, Ont.

The Hinde & Dauch Paper Company of Canada have manufactured since the first of the year 31,300 Corrugated Bread Containers. They have installed new machinery in Toronto to manufacture Solid Fibre Board Boxes, which will be placed on the market in a few weeks. These boxes are being used by many large packing establishments and are a non-puncturing, absolutely waterproof container.

IN NORWAY.

"Farmand," Norway, says, October 24: "Those who expected a great boom in the Paper trade as a consequence of the war have been sadly disappointed. In the first days of panic, it is true, fabulous prices were asked, and in isolated cases they were also paid. But the market soon lost its anxiety as to future supplies and the tone has become more and more quiet with a gradual slowing down of business.

The demand for Moist Mechanical Wood Pulp has temporarily disappeared almost completely, mainly as a result of the big importation to U. K. on the re-opening of shipping and of the continued interruption of shipments to France and Belgium. The reports published in the daily papers on the water scarcity are simply appalling. In large districts of our country the farmers will have to cart water over long distances for the cattle, and the conditions are just as bad in Sweden. The output of mechanical pulp during the winter will therefore be greatly restricted, if heavy rains do not come soon. We are therefore still of the opinion that prices will be adjusted on a higher level than before the war.



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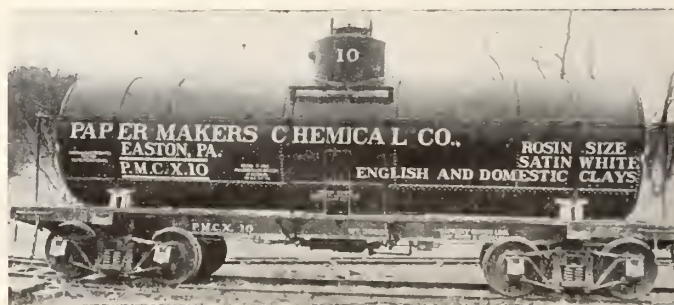
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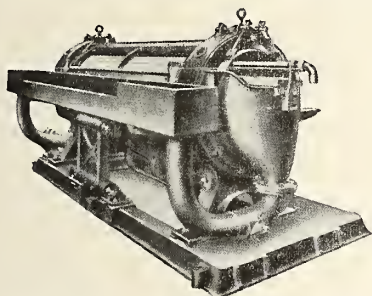
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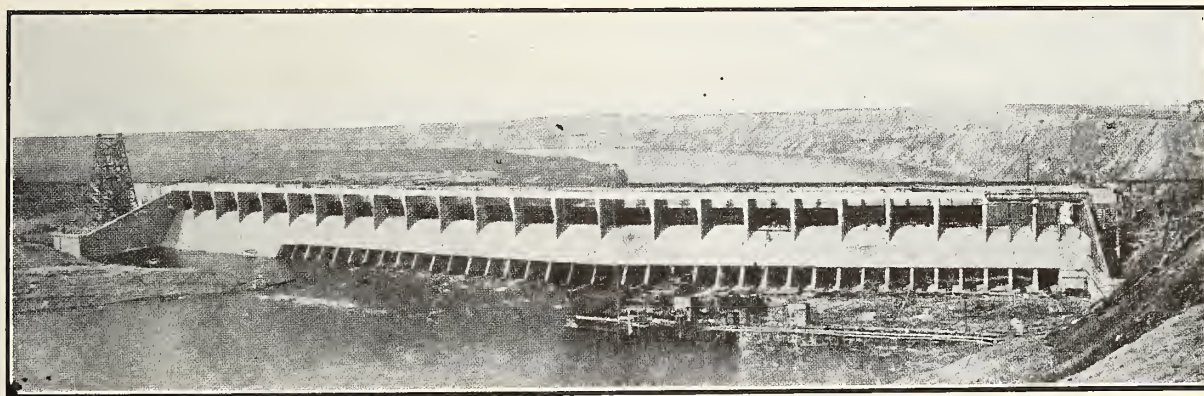
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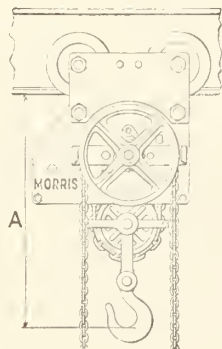
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Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippet Arthur P. & Co., Montreal, Can.
- Filters**
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Pusey & Jones Company, Wilmington, Del.
- Friction Hoists**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

- Glens Falls Mach. Works, Glens Falls, N.Y.**
 Hamilton, Wm., Co., Peterboro, Can.
 Jenckes Machine Co., Sherbrooke, Que.
 Pusey & Jones Company, Wilmington, Del.
 Voith, J. M. Co., inc., New York, N.Y.
 Voith, J. M., Wurtemberg, Germany.
 Waterous Engine Works Co. Ltd., Brantford, Ont.
- Trolleys**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Hoists**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
 Northern Crane Works Limited, Walkerville, Ont.
- Hoists—Chain Electric and Pneumatic**
 Blethen, Hugh R., New York, N.Y.
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Jordan Engines**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Jones, E. D. & Co., Pittsfield, Mass.
 Process Engineers, Ltd., Montreal, Canada.
- Knives**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Crookes, Roberts & Co., Sheffield, Eng.
 Hay, Peter, Knife Co., Galt, Can.
 Tippet, A. P. & Co., Montreal, Can.
- Koilergangs**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Pusey & Jones Company, Wilmington, Del.
- Laying Machines**
 Chambers, Ltd., Toronto.
 Collis & Sons, J., London, Eng.
- Motor**
 Chambers Ltd., 152 Bay Street, Toronto.
- Presses**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Can. Boomer & Beschert Press Co., Montreal, Can.
 Chambers Ltd., 152 Bay Street, Toronto.
- Paper Stock, Etc.**
 Hough, R., London, England.
 Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Paper and Pulp Machinery**
 Beloit Iron Works, Beloit, Wis.
 Bentley & Jackson, Bury, England.
 Bertram, James & Son, Ltd., Edinburgh, Scotland.
 Bertram's, Ltd., Edinburgh, Scotland.
 Black-Clawson Co., Hamilton, Ohio.
 Canadian Boomer & Boschert Press Co., Ltd., Montreal.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto, Can.
 Dillon Machine Co., Lawrence, Mass.
 Emerson Mfg. Co., Lawrence, Mass.
 Farrel Foundry & Mach. Co., Ansonia, Conn.
 Fullner, H., Warmbrunn, Germany.
 Glens Falls Machine Works, Glens Falls, N.Y.
 Green Bay Barker Co., Green Bay, Wis.
 Hamilton, Wm., Co., Peterboro, Can.
 Harmon Machine Co., Watertown, N.Y.
 Jenckes Machine Co., Sherbrooke, Que.
 Jensen og Dahl, J. & A., 1 Broadway, New York City.
 Jones, E. D. & Sons Co., Pittsfield, Mass.
 Johnson, C. H. & Sons, Ltd., Montreal, Can.
 Marx, I. & Co., London, E.C., England.
 Moore & White Co., Philadelphia, Pa.
 Process Engineers, Ltd., Montreal, Canada.
 Pusey-Jones Co., Wilmington, Del.
 Rice, Barton & Fales Worcester, Mass.
 Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
 Scott, Ernest & Co., Fall River, Mass.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
 Smith, S. Morgan, Co., York, Pa.
 Stebbins Eng. & Mfg. Co., Watertown, N.Y.
 Ticonderoga Machine Works, Ticonderoga, N.Y.
 Valley Iron Works, Appleton, Wis.
 Voith, J. M., New York, N.Y.
 Voith, J. M., Wurtemberg, Germany.
 Walmsley, Chas. & Co., Bury, Eng.
 Waterous Engine Works Co., Ltd., Brantford, Can.
 Westbye, P. P., Peterboro, Can.
- Paper Machine Tachometers**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Paper Tester**
 Chambers Ltd., 152 Bay Street, Toronto.
 Marshall, T. J. & Co., Stoke Newington, London, England
- Pneumatic Thickeners**
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Process Engineers Limited, Montreal, Can.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
- Pulp Stones**
 Lombard & Co., Boston, Mass.
 Stancliffe Estates Co., Ltd., Darley Dale, England
- Pumps**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers, Ltd., Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Dillon Machine Co., Lawrence, Mass.
 Glen Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm., Co., Peterboro, Can.
 Lawrence Machine Co., Lawrence, Mass.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Pusey & Jones Company, Wilmington, Del.
 Smart-Turner Machine Co., Hamilton, Can.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Voith, J. M., New York, N.Y.
- Recording Gauges**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Jensen og Dahl, J. & A., 1 Broadway, New York City.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Marx, J. & Co., London, E.C., England.
 Process Engineers, Ltd., Montreal, Canada.
 Pusey & Jones Company, Wilmington, Del.
 Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rope, Cotton and Manilla**
 Jones and Glassco, St. Nicholas Building, Montreal
- Rosin Size**
 Fox, Stockell & Co., London, Eng.
 Paper Makers Chemical Co., Easton, Pa.
 Process Engineers, Ltd., Montreal, Canada.
 Vera Chemical Co., North Milwaukee, Wis.
 Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Process Engineers, Ltd., Montreal, Can.
- Rotary Silver Screens**
 Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Rotary Sulphur Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Pulp Mill Machinery Co., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-A-ills**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Waterous Engine Works Co., Ltd., Brantford, Can.
- Self Landing, Self Delivery Hoists**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Screen Plates**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
 Bertrams Ltd., Edinburgh, Scotland.
 Bezner, Albert, 299 Broadway, New York City
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Mach. Wks., Glens Falls, N.Y.
 Harmon Machine Co., Watertown, N.Y.
 Jenckes Machine Co., Sherbrooke, Que.
 Johnson, Chas., St. Henry, Que.
 Marx & Co., J., London, England.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
 Tippet Arthur P. & Co., Montreal, Can.
 Voith, J. M., New York, N.Y.
 Waterous Engine Works Co. Ltd., Brantford, Can.
 Westbye, P. P., Peterboro, Can.
- Shear Legs**
 Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
- Slings**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Cameron Machine Co., Brooklyn, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Moore & White Co., Philadelphia, Pa.
 Pusey & Jones Company, Wilmington, Del.
 Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
 Pickles, W. F., Buckland, Conn.
- Stuff Chests**
 Boving & Co., of Canada Limited, Toronto, Ont.
- Suction Couch**
 Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Sulphate Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
- Gauges**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
 Chambers Ltd., 152 Bay Street, Toronto.
 Siemens Co., of Canada, Ltd., Montreal, Can.
- Governors for Electrical Driven Grinders**
 Jensen og Dahl, J. & A., 1 Broadway, New York City
- Governors for Water Driven Grinders**
 Jensen og Dahl, J. & A., 1 Broadway New York City
- Grinders**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.

MILL SUPPLIES---Continued

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Blithen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Strainers
Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery
Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B. Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatchouan Falls Paper Co., Ouatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B. Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merriton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manila."

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Deputy Minister.

Department of the Interior, Ottawa,

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co. Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 MacLeod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibreloc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

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Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

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Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New-
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnocona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

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 Canada Paper Co., Montreal, Que.
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 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
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 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
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 Toronto Paper Manufacturing Co., Cornwall, Ont.



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McFarlane, Son & Hodgson, 14 St. Alexander.
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Robertson & Parker, St. Paul.
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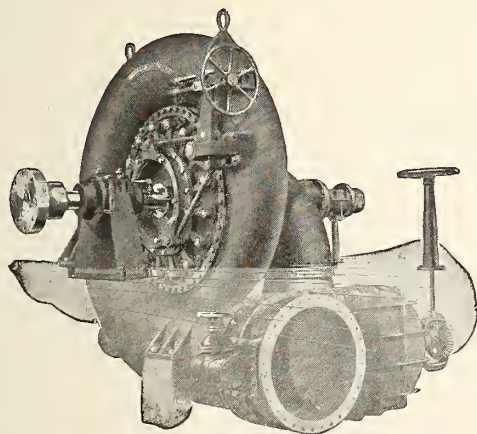
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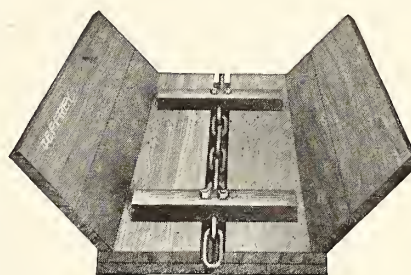
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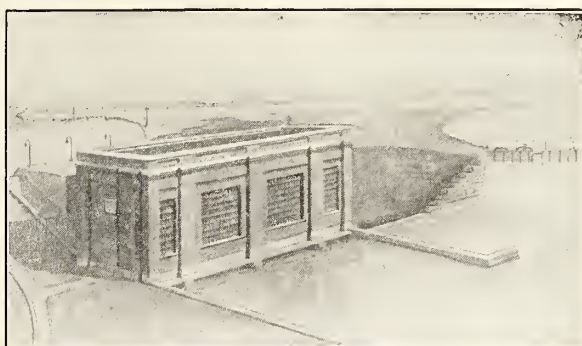
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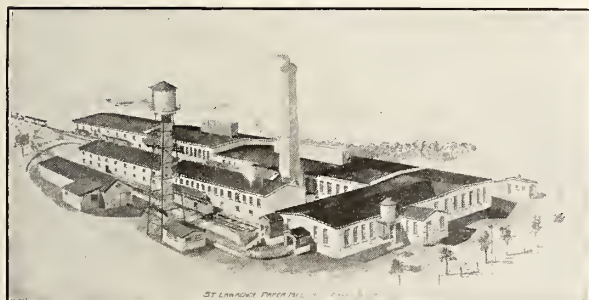
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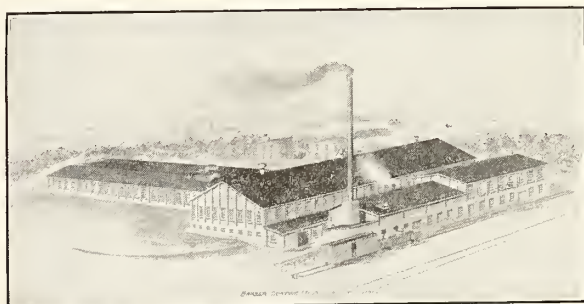
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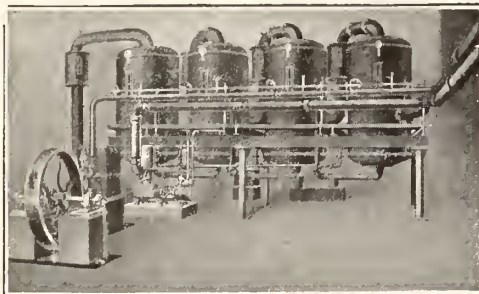
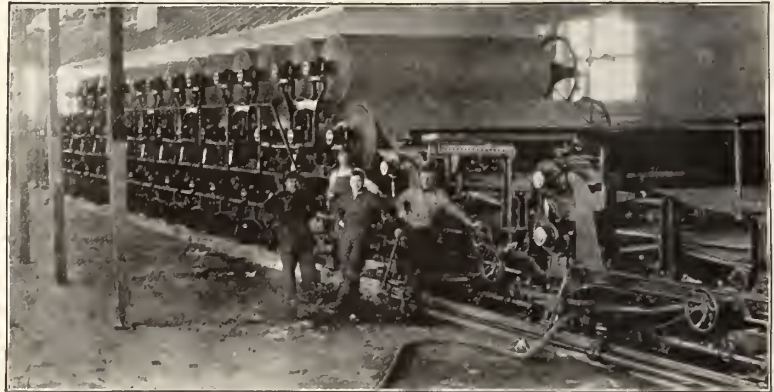
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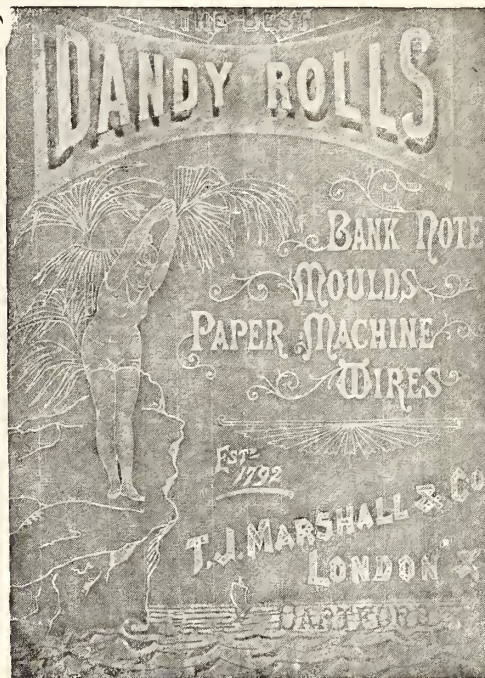
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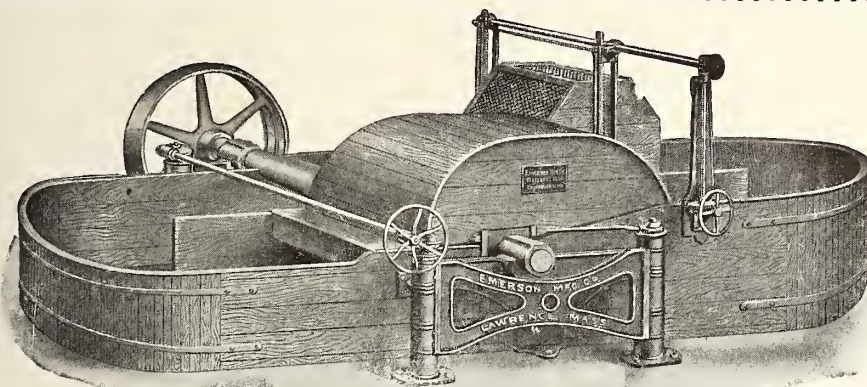
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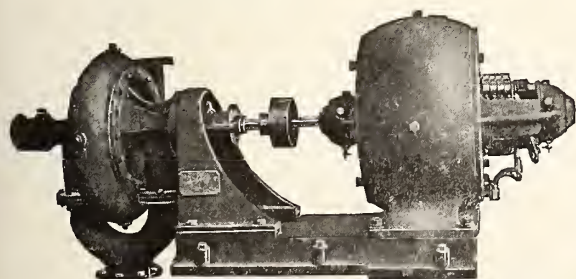
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LET US FIGURE ON YOUR REQUIREMENTS

Occupying a Trade Vacuum

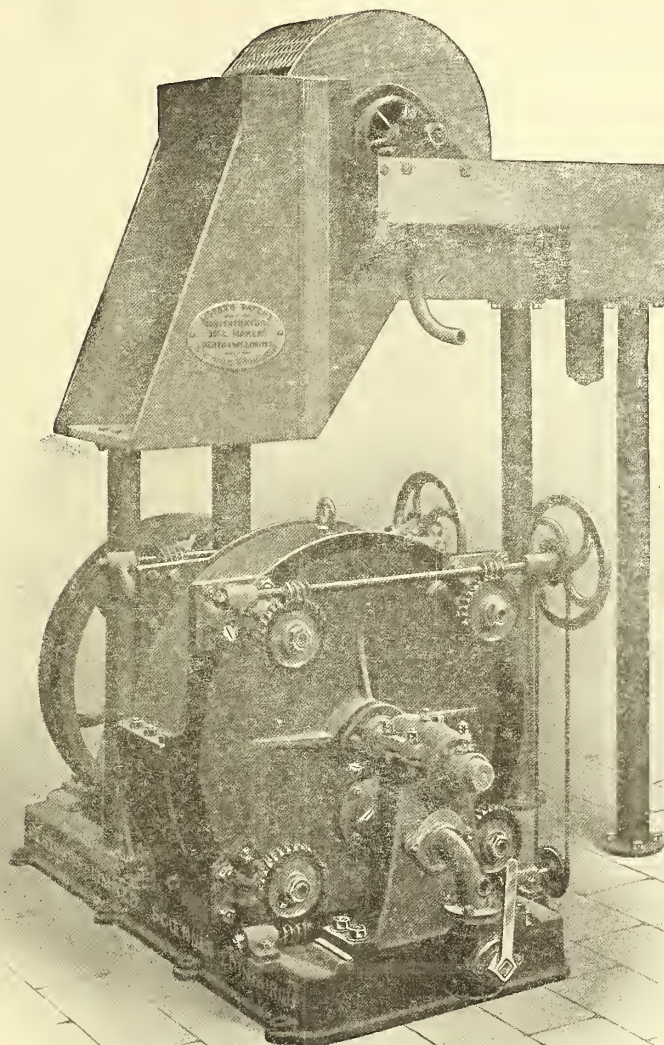
THE withdrawal from the Canadian market of much merchandise that prior to the war came from Continental Europe left, as it were, a trade vacuum, and a vacuum is abhorrent alike to Nature and to business.

The ceaseless effort on the part of business to expand itself has already led many a Canadian manufacturer to attempt to fill the void caused by the stoppage of imports from the countries at war.

The spinners and weavers of cotton are finding new and surprising uses for cotton as a substitute for jute. Manufacturers of electrical equipment are fast finding substitutes for materials and parts hitherto obtained from abroad. The growing of sugar beets and the making of beet sugar will be stimulated in Canada as a consequence of war. Yarns, hosiery, underwear, gloves, and garments for women and children, aforetime imported, will now be produced in Canada. And so one could go on and on in illustrating the triumph of human energy and genius over disabilities and disorders.

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THE ACTION OF THIS REFINER IS PERFECT

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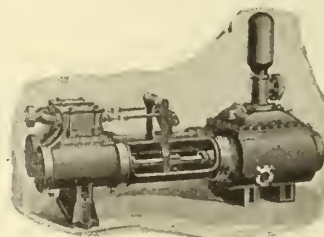
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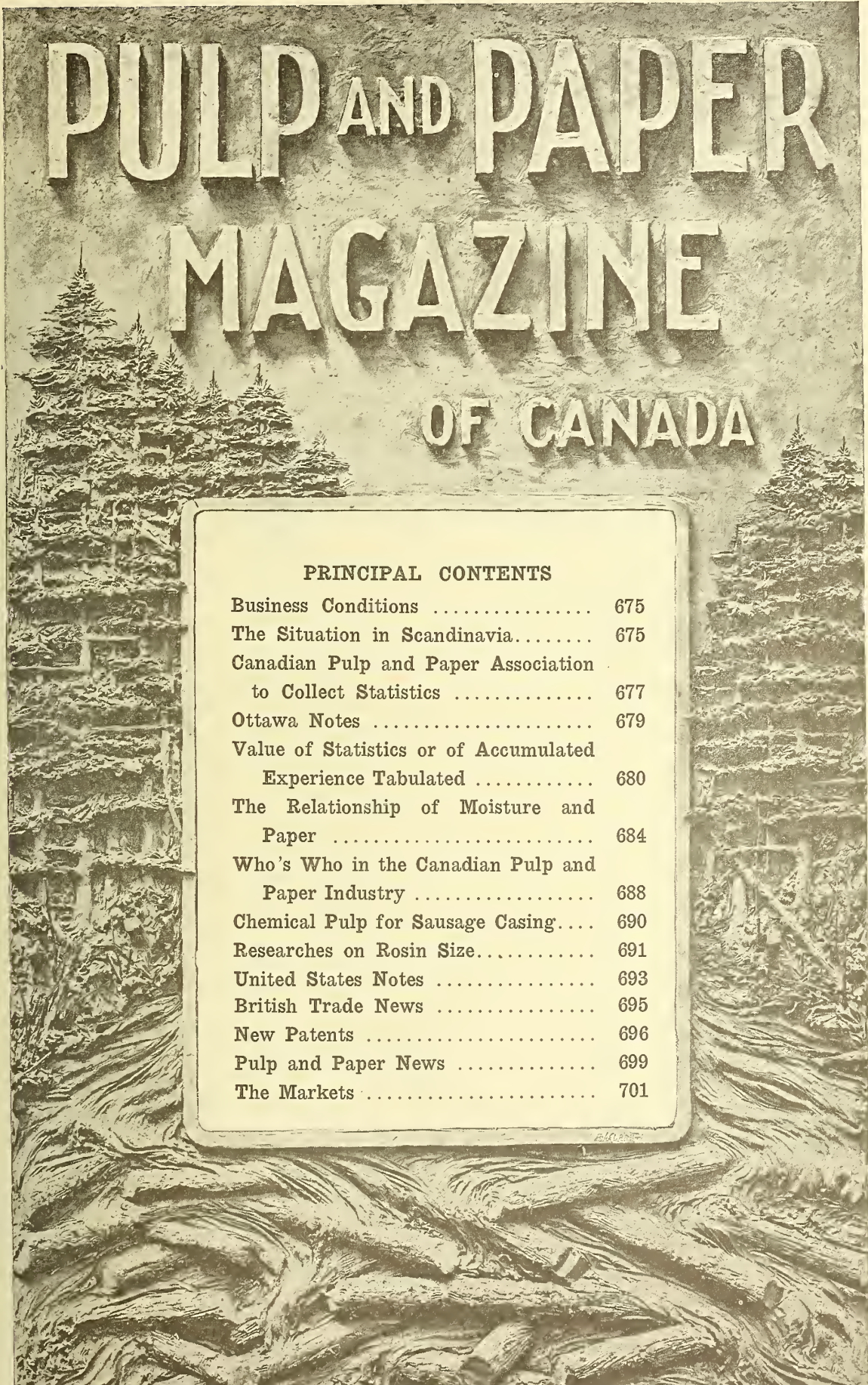
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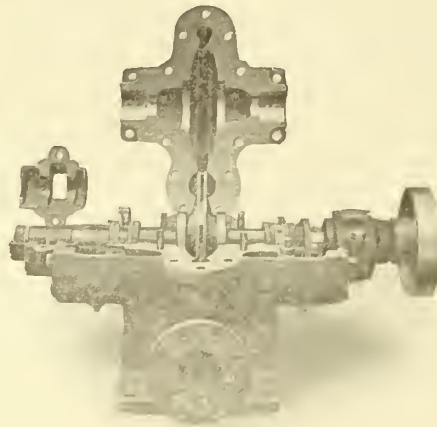
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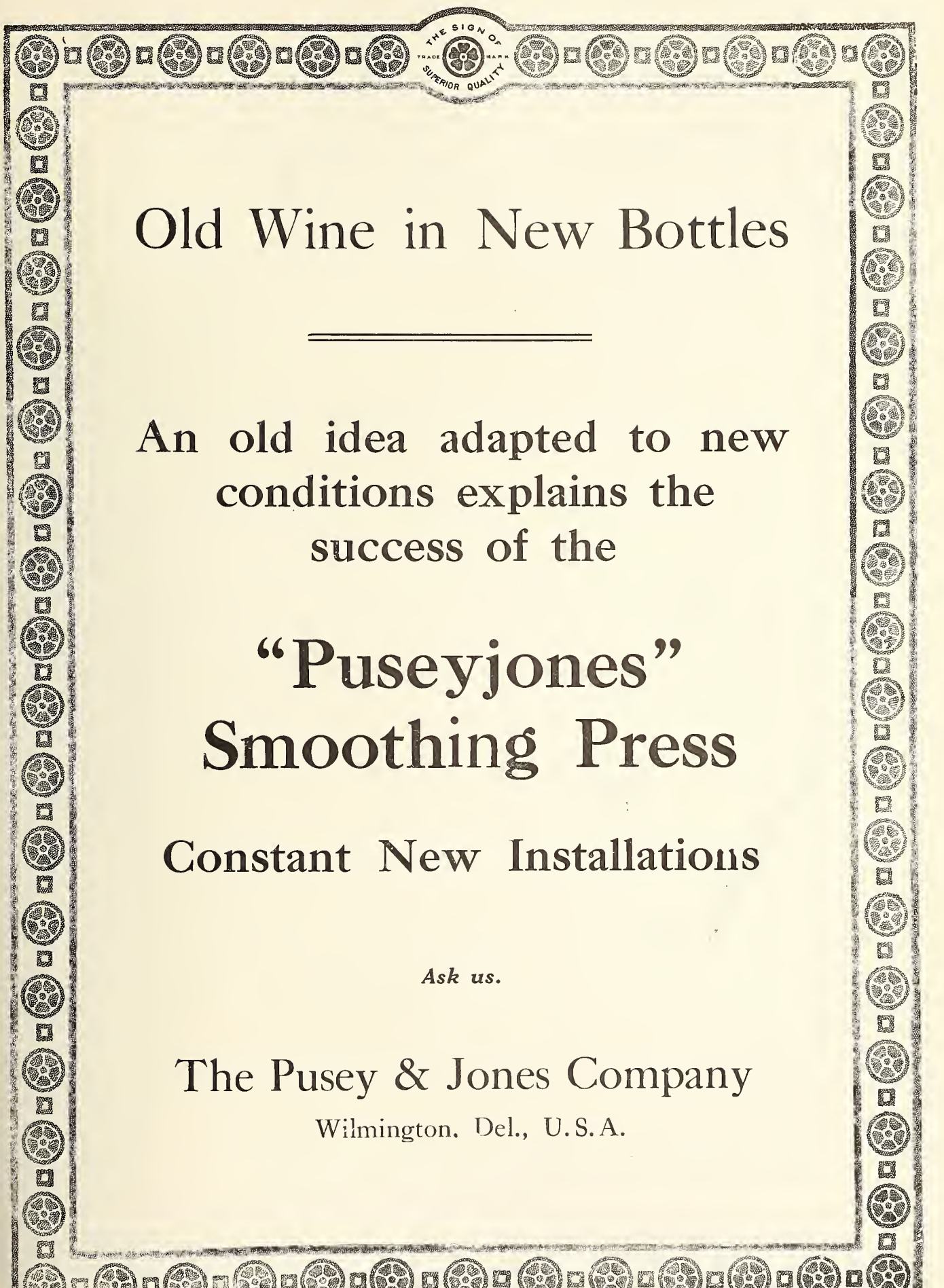
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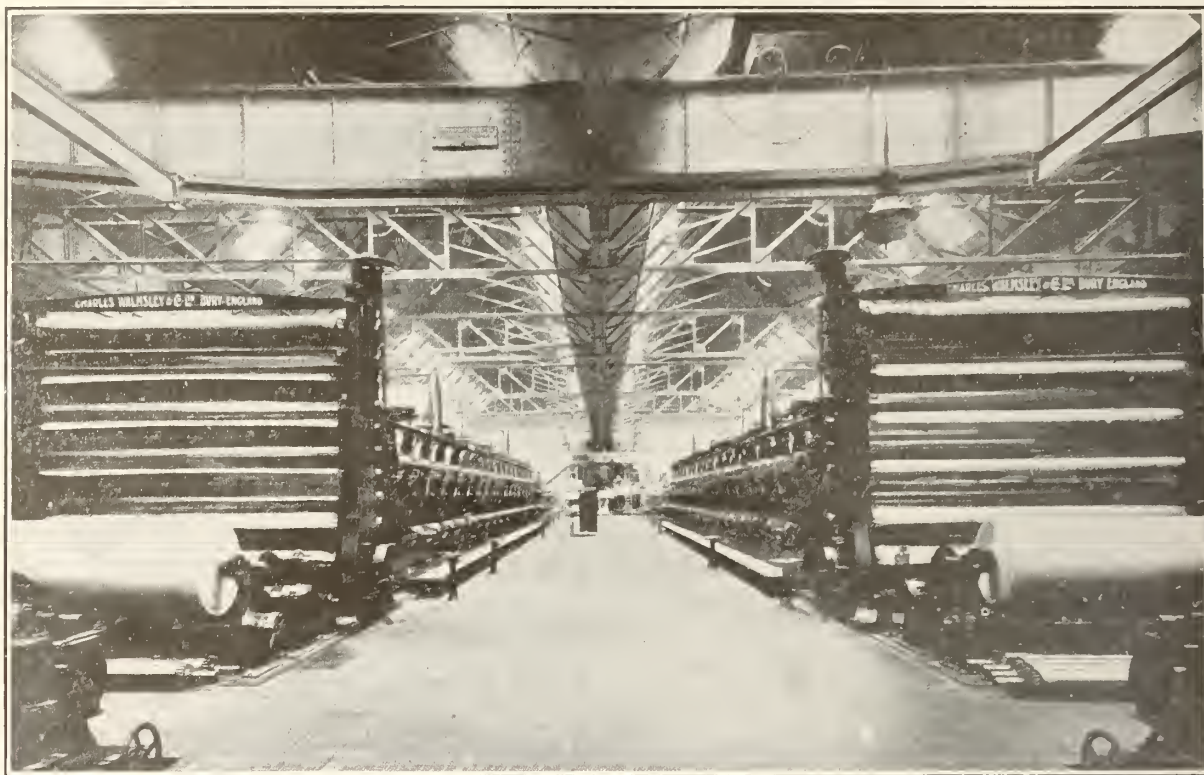
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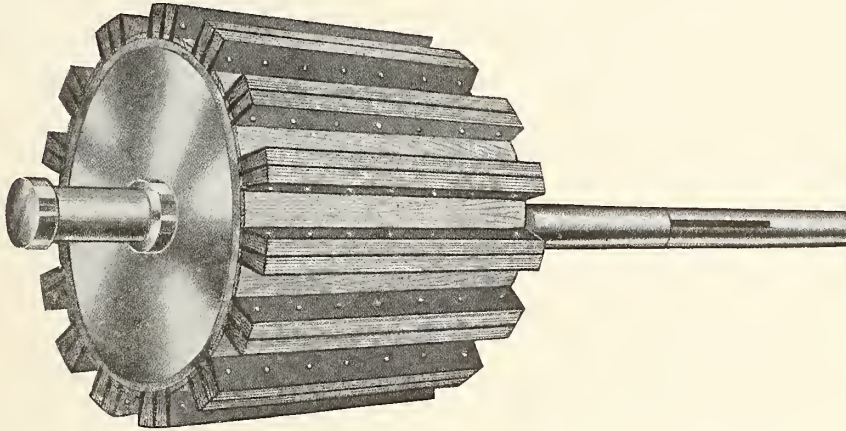
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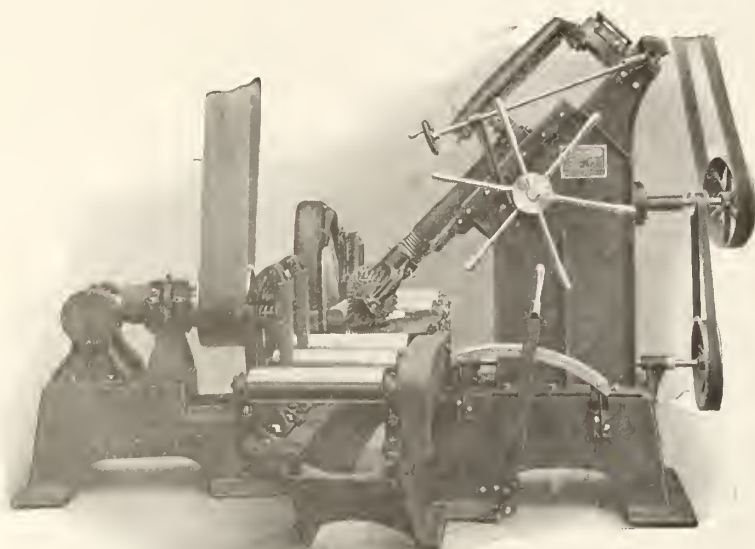
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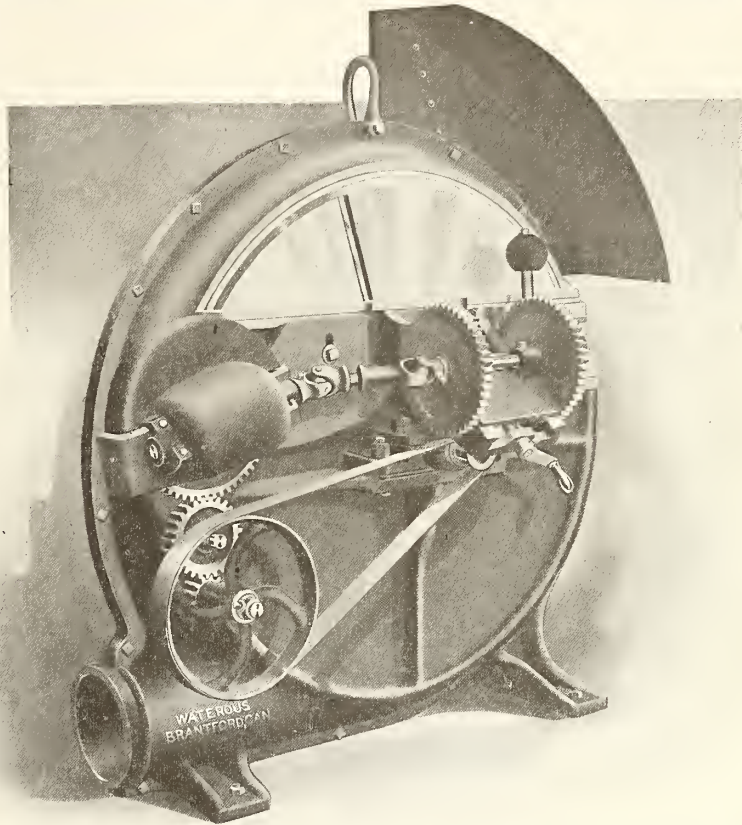
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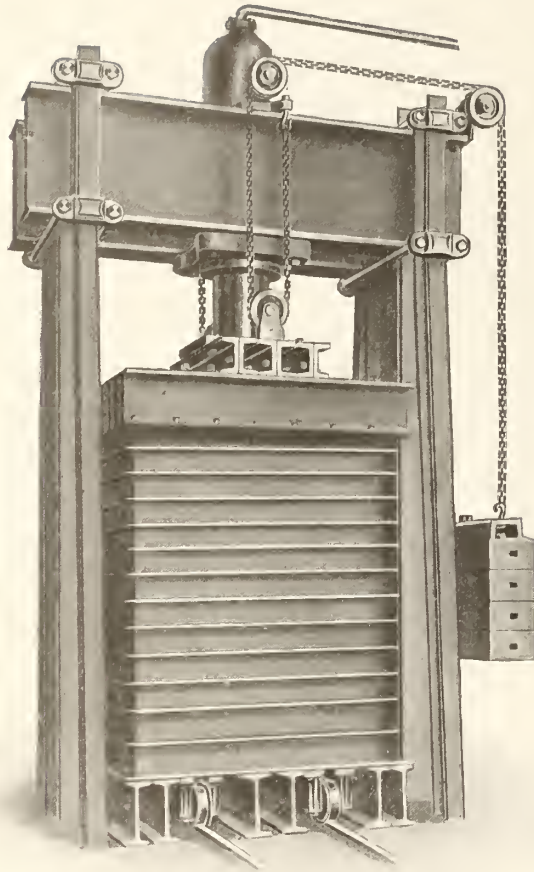
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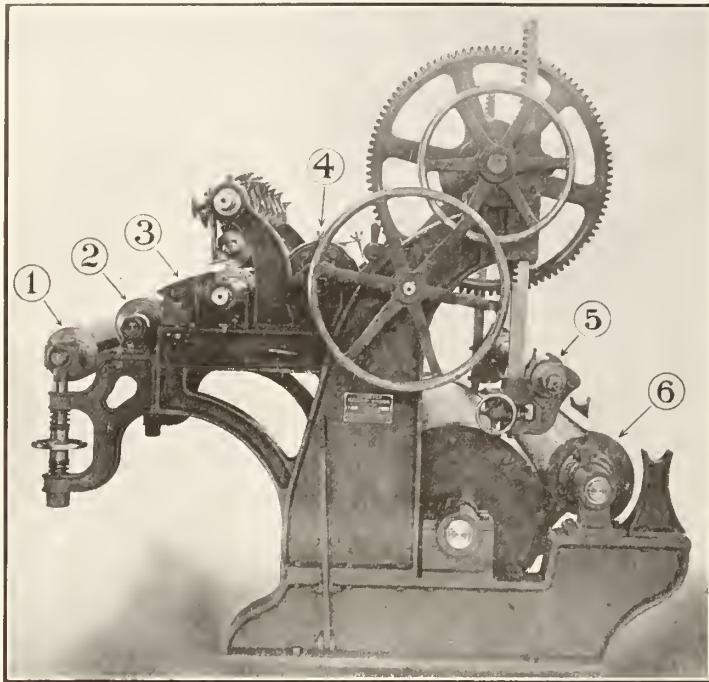
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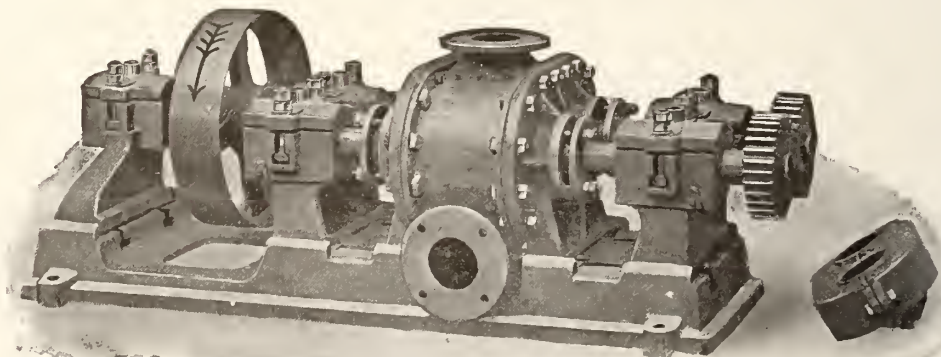
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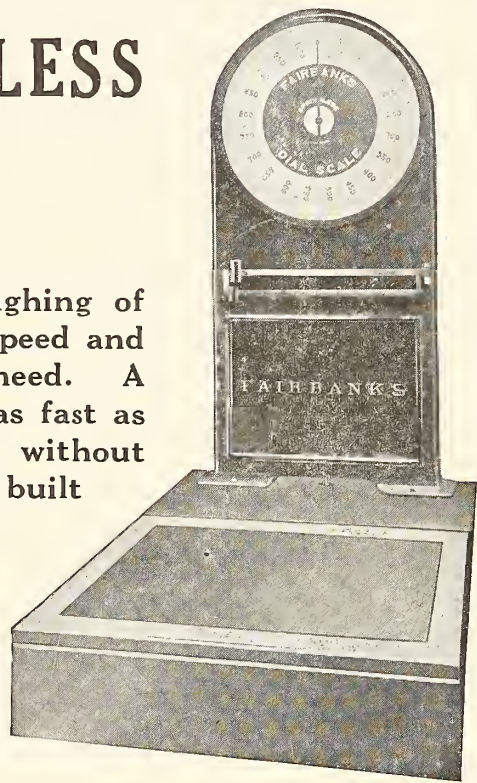
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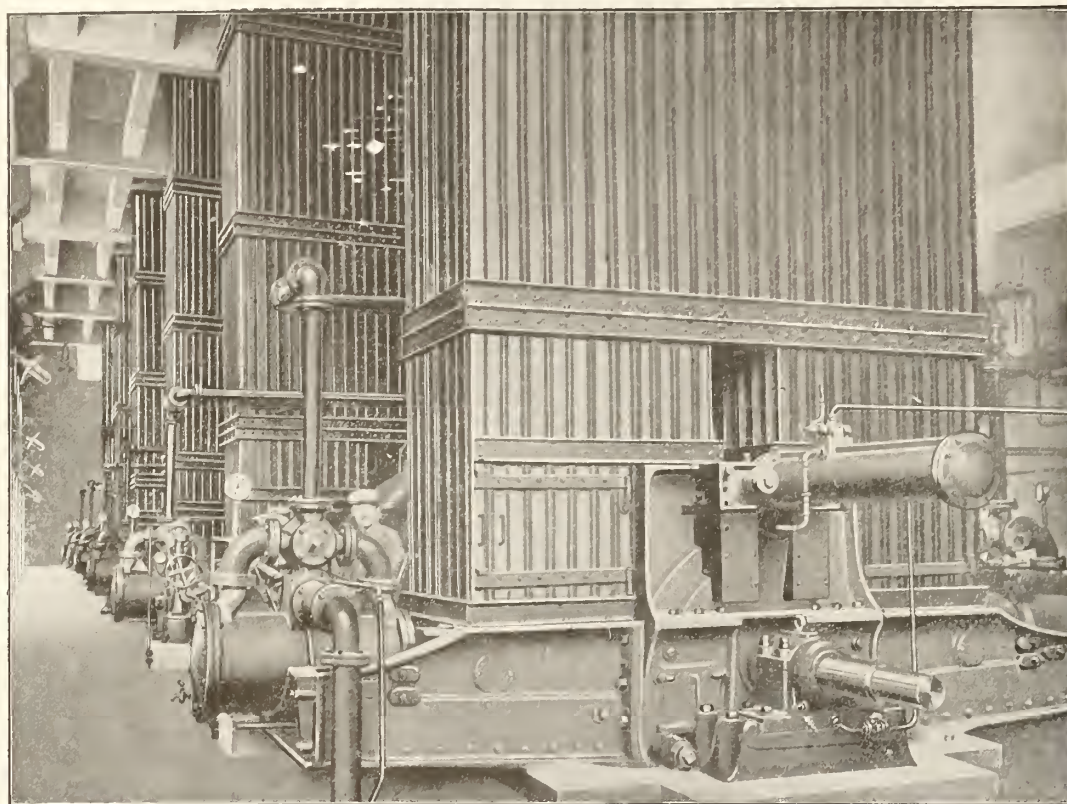
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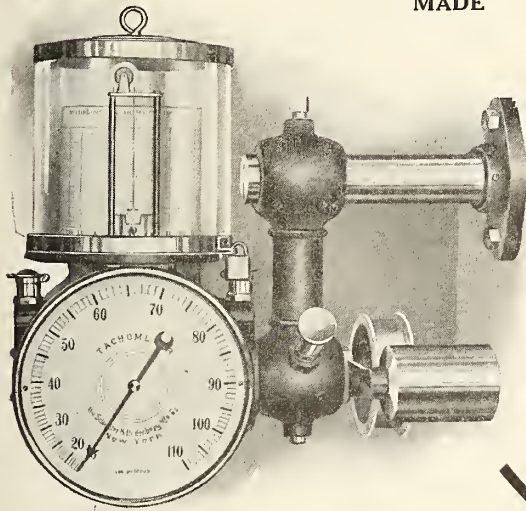
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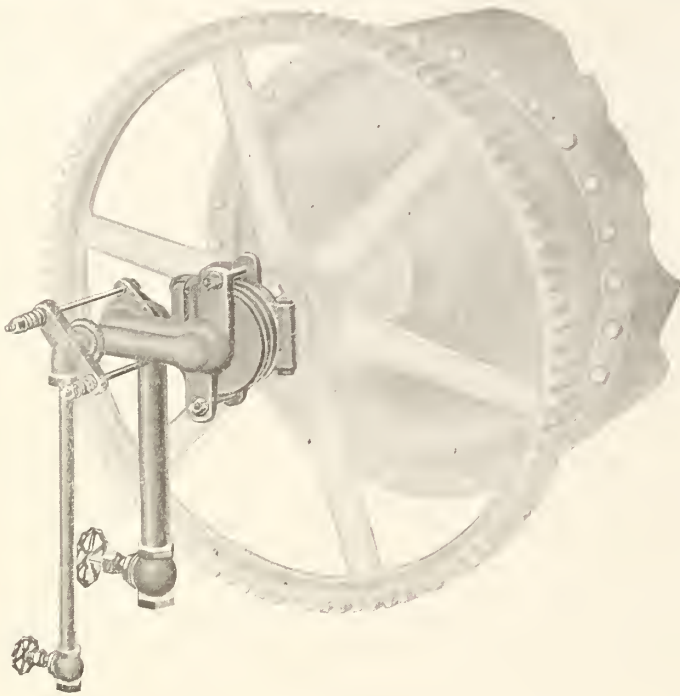
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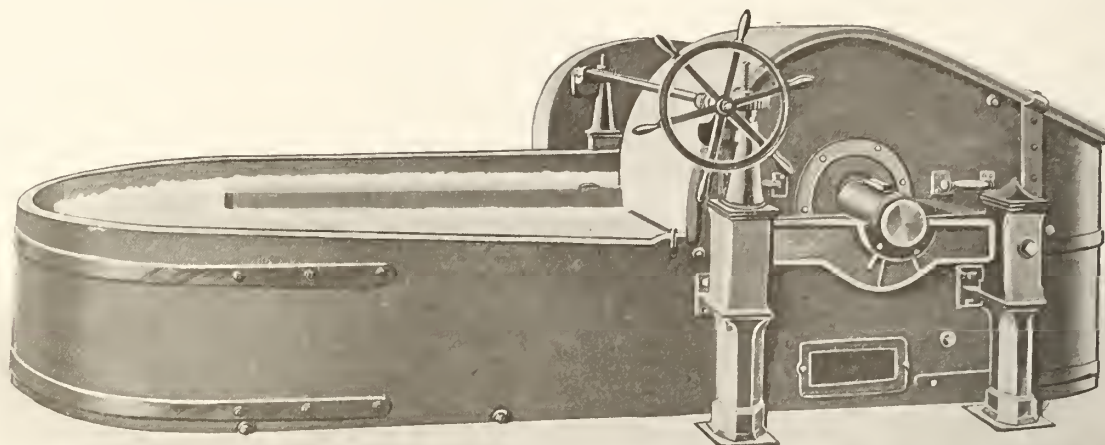
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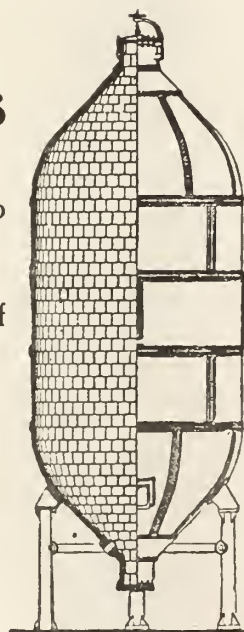
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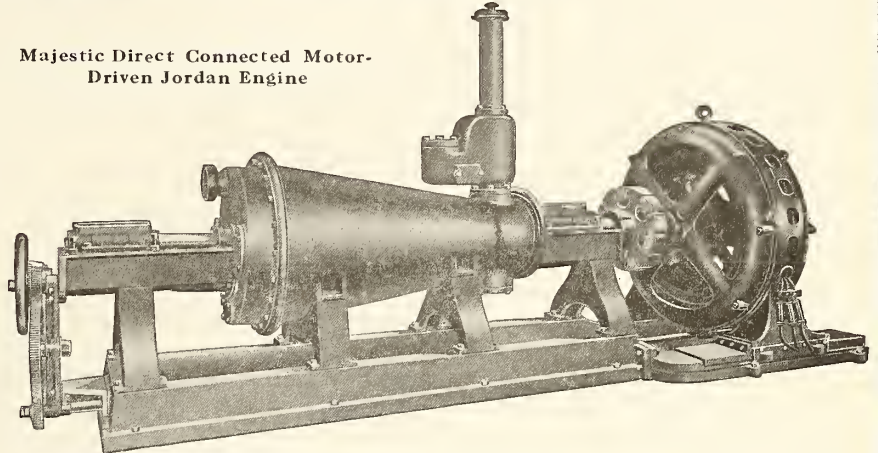


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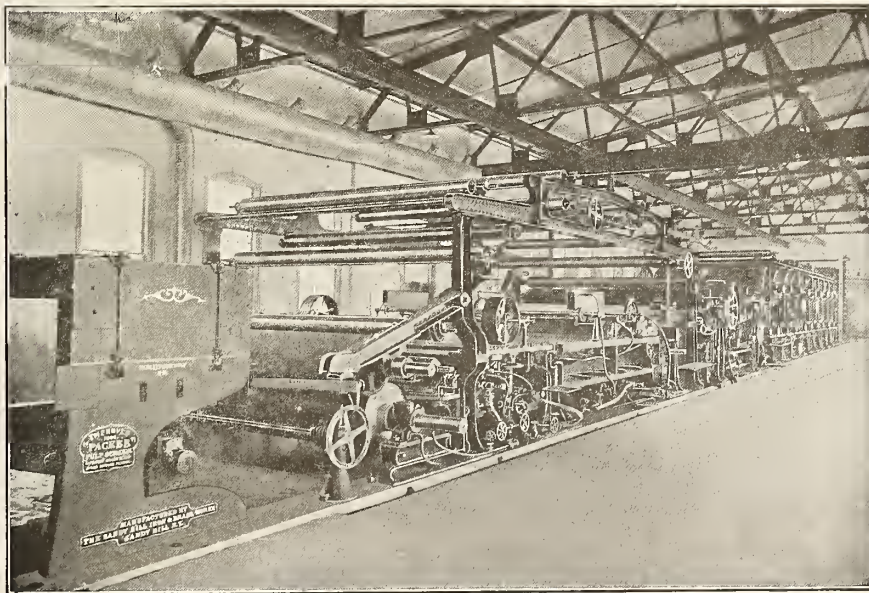
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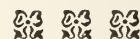
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Pulp and Paper Magazine

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A. G. McINTYRE, B.A., B.Sc., Contributing Editor.

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VOL. XII.

MONTREAL, DECEMBER 1, 1914

No. 23

The Canadian Pulp and Paper Association

The work of statistics collection which the Canadian Pulp and Paper Association is beginning, is one of the very highest importance in the industry. From the figures which will be sent in by the members, compiled by the Secretary, and issued to individuals in the form of aggregates, manufacturers will be able to form a very clear idea of the state of markets, stocks, and tendencies of shipments. It is a work which will benefit the individual and the industry alike; it will ultimately serve of immense service to the country, by indicating the most economic way in which the great part of the national resources can be handled by the nation's capitalists, laborers and Governments.

These statistical inquiries will have the effect of bringing into close communication with one another the various members of the industry, and mutual interests will be promoted. This has been thoroughly demonstrated in the American, British, Scandinavian and other pulp and paper associations. Associations and friendships are formed which lead to the very best of trade customs and to lasting benefits among the members. It has been found in the United States that the industry moves more smoothly, efficiency is increased, and that there is formed "camaraderie" which makes business life a joy.

The Canadian Pulp and Paper Association are moving to an enterprise which should form a firm basis for business for all time to come.

The Pulp and Paper Magazine would urge all manufacturers not only to join the Association, but also through it, to make unusual efforts to promote the welfare of the industry as a whole.

Business Conditions

Steady improvement may be said to characterize financial and industrial conditions in America. Canadians regard with great satisfaction recent events in the United States, which tend to loosen the money market and restore confidence. Chief among these is the opening of the twelve federal reserve banks, under the legislation not long ago adopted by Congress.

The New York and New Orleans cotton exchanges opened with unrestricted trading, and prices prevailing indicate that the crisis in the cotton situation is virtually past. Also the Savannah Board of Trade resumed trading in naval stores. The New York clearing house put into effect a change in its by-laws which released \$166,000,000 of cash reserves. In future only 18 per cent, instead of 25 per cent as formerly, of the cash reserves of its members will have to be held. Again, the curb market in New York opened for trading in unlisted stocks, and the Stock Exchange allowed free trading in municipal and state bonds of domestic account, both listed and unlisted.

War orders are pouring in from the belligerent nations, hundreds of millions of dollars for all kinds of provisions and army supplies being placed monthly. In three weeks in October, \$200,000,000 worth came in, and it is said that in one week Chicago alone received orders amounting to \$9,000,000. As the drain upon European supplies continues, there will be more and greater orders, all of which will tend to ease the financial situation in both Canada and the United States. Whatever may be the loss, which cannot help but attend all nations as a consequence of the war, America is likely to breast the storm fairly well.

The Canadian West will get a great deal of money from its crop, which, while not normal, is at least fair-

ly good, and prices, according to the recent trading are likely to reach \$1.25.

Canada's "Made-in-Canada" campaign is serving well to avoid temporary distress in the large manufacturing centres. The farmers will be comparatively well off, and the majority of what might be termed "primary industries" in the cities and towns will undoubtedly be stimulated.

There are many hard conditions still to be faced, but taken altogether the situation is favorable.

The Situation in Scandinavia

Recent reports from Norway, Sweden and Denmark indicate that the war is imposing very stern conditions upon the Scandinavian peoples. Not only has the proximity of actual naval warfare and the declaration by Britain that all the North Sea shall be a military area made trade difficult, but also the danger to vessels through mines or capture has been of late very pronounced. A great outcry was raised recently because of the detention by the British of a Norwegian ship bearing supplies of great importance to Norwegian manufacturers. Shipping in the Baltic, according to a correspondent of the London "Economist" has been much incommoded, and is, in fact, likely to be brought almost to a standstill through the action of the Germans, who have recently taken up and brought to Swinemunde a number of Scandinavian merchant steamers, principally Swedish, loaded with timber and other goods. Danish war risk insurance regulations have in consequence been made more stringent and much dissatisfaction is expressed, especially in Sweden, with the German doings. It has even been suggested that Swedish merchant vessels should have an escort of Swedish warships. Some 20 odd Danish, Norwegian and Swedish steamers are now detained at Swinemunde. The Danish-German steam ferry traffic between Gjedser and Wainemunde has again been stopped so far as the German steam ferries are concerned; traffic is now confined to those belonging to the Danish state railways.

All the Scandinavian states have had extreme difficulty in maintaining an attitude of neutrality. Newspapers divide their front pages exactly in two, and give one side to the Allies' reports, the other side to those of the Germans. Sections of both British and German peoples have made charges of partiality, against the Scandinavian states. A refutation of some of these charges, made to the London "Economist" by the Secretary of the Swedish Chamber of Commerce in London serves to show the nature of the Scandinavian neutrality troubles, and at the same time is of exceptional interest to pulp and paper manufacturers in exhibiting the shortage of supplies entering into the manufacture of pulp and paper.

In regard to coal this official says: "The importation into Sweden from the beginning of the year up to the

end of July, 1914, shows a shortage of 315,000 tons, compared with the corresponding period of the previous year. The imports during August last were 125,800 tons less than in August, 1913. Further, Sweden has in recent years imported considerable quantities of coal from Germany. These shipments were largely prevented during August and September, and so great was the want of coal in Sweden that the city of Stockholm and some other towns were compelled to reduce street lighting at the outbreak of the war, and many industries were in danger of being entirely stopped. When, besides, it is borne in mind that numerous industrial establishments, usually dependent on water power, were to a very great extent deprived of this source of power by the exceptionally dry weather during the spring and summer, and consequently had to fall back on coal, the absurdity of the alleged re-exportation of coal must be clear. As early as on August 2nd, on these grounds alone, the Swedish Government prohibited the exportation of coal, and have similarly forbidden the exportation of petrol."

The difficulty of obtaining sulphur is still pronounced. Stocks of cellulose are getting very low—much lower than at this time last year. This applies to sulphate also. On account of the large sales for prompt delivery which have been made during the war, the unsold quantity for delivery during the present year is also very small.

The water troubles, which have reached such an acute stage as to make it necessary for farmers to draw water for miles for their live stock, point to an unprecedented water shortage during the coming winter if present conditions hold for even a few weeks longer.

These conditions are of especial interest in America, where numerous factors have combined to place the pulp market in an entirely unusual position.

Before the winter is out we may expect some very peculiar tendencies, and if the wood shortage should be as acute in Scandinavia, as it would appear it may easily be, Canadians may be able to perform an unusual service to the pulp-consuming centres of the world.

CLEANING UP THE WOODS.

The intention expressed by Hon. W. H. Hearst, Minister of Lands, Forests and Mines in the Province of Ontario, that the embargo on the dying and down timber in the northern parts of the province will be raised shortly should be received with satisfaction in all quarters. The policy should have the effect of cleaning up many areas which would otherwise be nothing but fire traps.

It is expressly stated that this projected move on the part of the Ontario Government does not compromise in any way its well-known attitude on the pulp-wood exportation question.

CANADIAN PULP AND PAPER ASSOCIATION TO COLLECT STATISTICS

PRESIDENT RIORDON'S STATEMENT.

To Canadian Manufacturers of Pulp and Paper:

The Canadian Pulp & Paper Association has started the gathering of frequent statistics with regard to distribution of product, having achieved the first step that it undertook of obtaining a mem-



CARL RIORDON,
President of the Association.

bership representing considerably more than half the tonnage of pulp and paper made in the country.

It proposes to provide its members with a knowledge of their markets sufficient to enable them to direct their policies intelligently.

This is only one line of activity of many in its field which it will undertake one by one as it gets each one well organized.

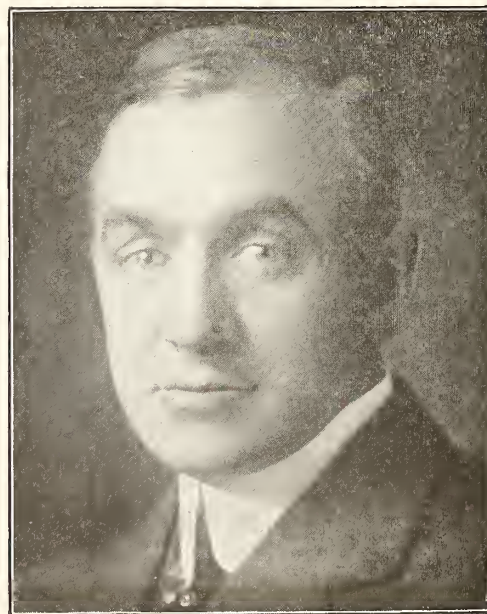
It seems certain that it will be of great value to all its members, and I earnestly urge all manufacturers of paper who have not already done so to join the Association, not only to receive the benefit of its work, but to help to make that work better.

At a meeting of the Executive of the Canadian Pulp and Paper Association held in Montreal, November 18th, plans were laid for activities which will bring the Association into its full sphere of usefulness to the industry. The meeting was called principally to receive the report of a special committee on statistics, composed of Messrs. Carl Riordon (convenor), J. H. A. Acer, A. G. Champion, and C. Howard Smith, which had been constituted at the previous meeting of the Executive. The Committee reported that, following several months of quiet steady progress, during which time several members had been added and the financial status of the Association considerably improved, the time now appeared opportune for the establishment of the work of statistics collection.

The committee had every assurance that the work would prove entirely successful, and recommended that no time be lost in advancing this most important part of the Association's activities.

The committee felt that the successful collection of statistics of production, shipments, stocks on hand and commitments in one or two classes of product would have the greatest influence in securing the co-operation of all mills in all other classes. The most promising division were therefore singled out for a beginning, and as time goes on, the others should be taken up.

As Mr. H. T. Meldrum, the Secretary-Treasurer of the Association, has been finding it impossible to undertake the work of the office in conjunction with



I. H. WELDON,
Vice-President.

his pressing duties as Montreal Secretary of the Canadian Manufacturers' Association, the appointment of a new secretary was recommended. The Executive has chosen Mr. Roy L. Campbell, Editor of the Pulp and Paper Magazine, to succeed Mr. Meldrum.

The Executive, through the President and Secretary, have already sent out blanks to secure from cer-

tain divisions a statement of production, shipments, etc., in November.

The blanks are to be filled out and returned to the Secretary immediately after the first of December. It is expected that on the day on which the last form is received from the contributing members the aggregate statistics will be made up and sent out. In this way members will be apprised of the actual volume of business.

It is confidently expected that at least one other division of manufacturers will be ready to make statistical returns in December.

These sections and the chairmen at present, are:—

Writing—C. Howard Smith.

Book—F. H. Gage.

News—G. M. McKee.

Miscellaneous—G. H. Millen.

Coated Papers—F. A. Ritchie.

Chemical Pulp—T. J. Stevenson.

Ground Wood—K. L. Warren.



J. H. A. ACER,

Member Statistical Sub-Committee.

No statistics will be compiled for any class of information to which fewer than three mills contribute. In this way, individual reports will be "buried."

All figures are strictly confidential between the individual firm and the Secretary. No other person will have access to them.

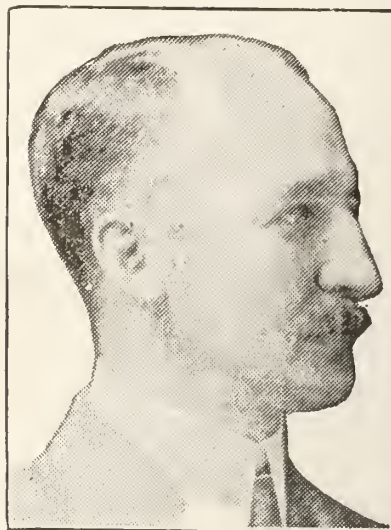
No firm will receive aggregate statistics in any class of information to which it does not contribute.

As time goes on, it is hoped and expected that the scope of the inquiry will be extended, until every point on which the members are willing to give and receive information will be included in the blank forms.

To those who have not yet joined the Association the Executive is sending out hearty invitations to become identified with the organization and to participate in the statistical enquiries.

As the body grows, other questions will be taken up, such as meteorological conditions, railway problems, tariff, and technical investigations.

It is expected that co-operation to the extent at least of exchanging aggregate statistics will be entered into



C. HOWARD SMITH,

Member Statistical Sub-Committee.

with the American Paper and Pulp Association, with whose officers the Canadian Association has already been in communication.

Altogether, the outlook for the success of the Association is most bright. The work of the past year, while quiet, has been conducive to firmness and thoroughness, and it is believed that the measures which the officers who held office in the Association at its inception about two years ago advocated, will now have an excellent chance of obtaining completion. The membership has increased in the last few weeks, and applications are now coming in. Members to date are:



ROY L. CAMPBELL,

Secretary Treasurer.

Abitibi Power & Paper Co., Ltd., Montreal.
 Barber Paper & Coating Co., Ltd., Georgetown, Ont.
 The Beaver Companies, Thorold, Ont.
 Belgo-Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, Que.
 F. W. Bird & Son, East Walpole, Mass.

J. R. Booth, Ottawa, Ont.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Donnacona Paper Co., Ltd., Quebec, Que.
 The E. B. Eddy Co., Ltd., Hull, Que.
 J. Ford & Co., Portneuf Station, Que.
 The Interlake Tissue Mills, Ltd., Toronto, Ont.
 Kinleith Paper Co., Ltd., Toronto.
 Laurentide Co., Ltd., Montreal.
 Jas. MacLaren Co., Ltd., Buckingham, Que.
 MacLeod Pulp Co., Ltd., Liverpool, N.S.
 The National Paper Co., Montreal.
 Ed. Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Powell River Co., Ltd., Powell River, B.C.



H. T. MELDRUM,
 Retiring Secretary-Treasurer.

Riordon Pulp & Paper Co., Ltd., Montreal.
 Ritchie & Ramsay, Ltd., Toronto.
 Riviere du Loup Pulp & Paper Co., Ltd., Fraserville,
 Que.
 Howard Smith Paper Mills, Ltd., Montreal.
 Spanish River Pulp & Paper Mills, Ltd., Toronto.
 St. Lawrence Paper Mills Co., Ltd., Toronto.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.
 Union Bag & Paper Co., New York.
 Wayagamack Pulp & Paper Co., Ltd.

APPEAL ON INTERSWITCHING RATES.

At the hearing last week the claim was made by representatives of the Canadian Manufacturers' Association, the Canadian Lumbermen's Association and others, that inter-switching rates in Canada were higher than those in the United States, from \$8 to \$12 per car in Toronto and Montreal, they asserted, as compared with an average of from \$5 to \$9 in the United States cities. The case was finally adjourned to come up again in a few days.

Ottawa Notes

Ottawa, Ont., November 25.—Supreme Court of Canada will shortly give judgment in a case of interest to the pulp and paper world, that of the Chicoutimi Pulp Company against Col. William Price, of Price Brothers, Quebec, lately noted as the man who made all the arrangements for the preparation of Valcartier camp, and the departure of the first Canadian overseas contingent. The Chicoutimi Company sued Col. Price for libel and asked a verdict of \$25,000. It was claimed that in 1904 Col. Price had written to the Montreal Gazette and other newspapers alleging that the Chicoutimi Company had influenced the Quebec Legislature to obtain the lease of limits in the province. When the case first came to trial in the Superior Court of Quebec, the action was dismissed, but on an appeal being taken to the Court of King's Bench a verdict was given for the company. Col. Price then appealed to the Supreme Court, which has reserved judgment.

At a meeting of the Railway Commission held in Ottawa a week ago, an application by the Riordon Pulp and Paper Company in the matter of Canadian Northern Railway rates was to have been heard, but was postponed. The company is complaining against increased rates on wood pulp and sulphite from Merriton and Thorold, Ont., to points in the United States, made effective on November 16, by a supplementary tariff issued by the railway.

The only pulp and paper incorporation at Ottawa during the last two weeks has been that of the Sandwich Bay Pulp and Lumber Company, Ltd. The incorporation is a rather important one, the capitalization being two millions. The company seeks power to take over timber lands in Sandwich Bay, Labrador and Newfoundland where it will carry on a general pulp and paper and lumber business. It also seeks authority to engage in fur trading. The incorporators are all Montreal brokers, Messrs. Aurele, Lucien and Arthur Bernier, George Etienne DeSeve and Oscar Beauchamp.

Extensive construction work is proceeding at the J. R. Booth plant. A new steel and concrete timber mill is being constructed to replace the one destroyed by fire some months ago. This is noteworthy as the only building of its kind which the Booth firm has let by contract. The Dominion Bridge Company is putting it up, whereas it has always been the custom of Mr. J. R. Booth to do work of this kind by day labor under his own personal supervision. He is now carrying on extensive dam and flume work in this manner, the letting of the timber mill contract having been due to his indisposition consequent on the accident which he sustained at the plant some months ago. This has been a fairly busy year at the Booth plant as a result of accidents, fires and new construction, a new sulphite mill having been built as an addition to the present mill.

While pulp and paper firms on the Ottawa are still operating all the lumber mills have now closed down, the W. C. Edwards firm being the last to do so. Both the E. B. Eddy and J. R. Booth firms are operating more or less under difficulties, as, on account of the low water in the Ottawa, they have to shut down their plants at night to allow the City of Ottawa to obtain sufficient head for fire pressure purposes.

VALUE OF STATISTICS OR OF ACCUMULATED EXPERIENCE TABULATED

By E. S. MACPHAIL,
Census Branch, Dept. Agriculture, Ottawa.

Statistics may be said to be to a nation what book-keeping is to an individual and may be divided into two main divisions—administrative and scientific. Under the head of the former may be included the census, the chief purpose of which is demographical, that is, to supply information as to the numbers and local distribution of the population, the numbers of each sex by age, civil condition, origin, nationality, nativity, occupations, education, etc. This is the minimum of information required for national administrative purposes. Governments also gather statistics of trade and facilitate the collection of revenue. They collect statistics of crime in the ordinary course of judicial procedure and vital statistics are collected to aid in preventing crime, to facilitate the transference of property and to make the foundations of social life secure. The statistics of agriculture, manufactures, mining, etc. are collected to enable the government to gauge the progress of these industries, to enable it to intelligently lend a fostering hand, where it is shown that such help can be given without paternalism and where it may act as near a stimulus to greater extension and more intelligent operations.

Statistics provide methods for the scientific sifting of the accuracy of statements, for measuring the significance of differences, for comparing the results obtained under similar conditions in one country or province with those obtained in another, and the expression and analysis of the differential relationships. In short the science of statistics is the chief instrumentality through which the progress of civilization is now measured and through which its development hereafter will be largely controlled. In the words of the Hon. S. N. D. North, late Director of the U. S. A. Census, "In the last analysis the science of statistics is the chief instrumentality upon which the world now depends in its efforts to advance the movement which is at ferment in every civilized land."

Statistics enable the student of events, whether national or of a particular industry, to grasp the why and the wherefore of the stagnation, retrogression or advancement of the country as a whole, or in any of its component parts, or of any industry or of the various factors the aggregate results, which we are pleased to term either the success or failure of the policies pursued. And unless we have reliable statistics bearing on these subjects we may be wittingly or unwittingly led to wrong conclusions. Mark Twain said that "There were two ways of deceiving our fellow-men—one by perjury, the other by statistics." Again quoting Dr. North "All great subjects of modern legislation depend for their intelligent handling upon the accuracy and completeness with which the facts have been statistically developed. Our civilization has grown so complex, so sensitive in its manifestations and reactions that it would cease to operate effectively if it were deprived of accurate, systematic, money, of production and consumption in all lines of industry.

Augustus G. Webb in his preface to the complement of Mullhalls New Dictionary of Statistics says "Statistical comparisons are always treacherous unless the things are adequately defined." He also says "It is perhaps not too much to say that the statistics of any country cannot be unreservedly compared with those of another dealing ostensibly with the same subject."

Bearing in mind these limitations which are more or less true of all classes of statistics and the fact that in a paper of ten or fifteen minutes duration we cannot more than state as briefly as may be the value of statistics as they stand in relationship to the establishment and probable subsequent success of an industry or as an indication of demographical or commercial development. In weighing the results obtained by a particular industry in a certain locality or country with a view of castings a horoscope of the probabilities of success of a similar venture in another or same location certain conditions must be carefully studied. The means for such a study can be supplied only by statistics, which are likely to be compilations and tabulations of returns obtained through the census or through the efforts of a particular group of industries whose managers are alive to the situation and realize the value of statistics.

In establishing a new industry a matter of the first necessity is to know the conditions under which a similar industry was or is a success or failure in another community and apply those conclusions statistically digested, to the venture in hand. To this end the captain of industry must have reliable statistics, giving (1) the character and composition of the population in the locality where it is destined to establish there is not likely to be an opening for the trade in which he is particularly interested. Paper is needed and used everywhere. True, but to produce it profitably and carry on the industry intelligently, the manufacturer must decide beforehand for what market he is going to trim his sails, so as not to be guilty of carrying coals to Newcastle. For example, a boot and shoe manufacturer could not expect to sell as many ladies boots as men's in Vancouver whose population is 60 per cent male, or in Calgary where males constitute 61 per cent of the population or in Regina where there are only 34 females to every 66 men.

The statistics of population, of exports, imports and production, of foreign countries will enable us to tell where there may be profitable openings for our surplus production. It is not meant that such expansion cannot be made without statistics, but it is maintained that it cannot be as intelligently made, that is to say, it is only when the same peculiarities are possessed by many persons that they become of importance, or as it is stated by Arthur L. Bowley in his "Elements of Statistics," "The object of a statistical estimate of a complete group is to present an outline which will enable the mind to comprehend with a single effort the significance of the whole." It must be remembered that it is impossible to follow or measure the motions of several atoms, that it is of small consequence to the forward movement of a nation whether any one

concern is snuffed out or shines. It is only when we begin to deal with aggregates and effect comparisons, which can only be accurately made on statistical basis, the plant and also of the place which is taken as the medium of comparison, (2) percentage of population native born or immigrant and also the country of birth of the latter, (3) the relative standing of the population male and female by ages, so as to be able to form a fairly accurate estimate of the probable supply of effective labour, (4) the educational standing of the community from which the labor is to be obtained—an illiterate community cannot supply as efficient employees for any, but the roughest kind of work, as can be supplied by a community the members of which have a working education. It is of small value for a comprehensive survey of the labour conditions which are likely to tend to the successful operation of an industry to know that in a certain locality there are some desirable people, the thing of value is, to know by aggregates which extend over successive periods whether the movement in population be forward or backward, or whether it be stagnant. It is only by such a method that an intelligent forecast of the kind of class and fixity of the labour supply can be determined. Such a review will give an idea of the probable cost of production, the kind and class of article which ought to be manufactured in such and such a community.

Statistics of population are of value to the producer as a means of determining where to push the sale of his goods. Every manufacturer should be a close student of the statistics of population not only of his own country but in every country where there is and where that same conclusions are arrived at.

A study of statistics enlarges the individual experience. You and I are limited to what we see; our knowledge is extended by various means—such as newspaper reports and the writing of experts and our thinking is apt to be biased by the peculiarities of our position. As soon as you and I commence to examine the various view points of our researches then we are conducting a statistical investigation, and as every man cannot be master of all trades hence the necessity of the statistician and statistical methods. Again quoting from the same author "A chief practical use of statistics is to show the relative importance—the very thing which an individual is likely to misjudge. The absolute magnitude of a quantity is of little meaning to us till we have some similar quantity with which to compare it." Those of us who have to handle figures, whether they be the statistics of a nation or those of a particular class of industries know that in the case of most statistics we need some means of comparison before we can appreciate the meaning of the questions in hand. For example the statistics of the first years of the operations of paper and pulp mills and of each successive year are necessary to ascertain to what extent the industry is progressing and as to whether its advancement has kept pace with the growth of population, particularly of the educated. It is only by a careful analysis of the statistics of the past that the evolution of the industry can be scientifically and truly weighed and reliable data secured to guide future developments. The output of a single pulp and paper mill is of little consequence to the general welfare of the industry as a whole. In other words it is only when the products of all pulp and paper mills are taken together in such a way as to be comparable with the results of previous years and with the results attained by mills similarly equipped in other countries that the value of their statistics become apparent and

useful. To do this intelligently it is necessary to have statistics of population, transportation, of labour conditions, wages and of the general economic conditions at each point of manufacture and distribution. Hence the value of statistics in arriving at safe conclusions as to the probable success or failure of an industry as carried on under certain conditions. There is absolutely no doubt that the consumption of paper is on the increase, but such a statement may be termed as a bold assertion unless backed up by statistics. The comparative tables given later on amply proves this. It is the business of the Government statistician to collect, arrange and describe such information as is necessary to the proper conduct of questions of administration, but to draw no deductions, it is his business to present evidence but not conclusions. These limitations should not be applied to the work of the statistician of an association. In the preparation of his statistical data he should not only collect, arrange and describe all the possible information relative to the sources of supply of raw material, their extent, and availability by specified areas in the whole country, the probable estimated requirements of the country for from ten to twenty years hence, as indicated by the trend of immigration, natural increase in population, the rise and development of cities and towns, but by a scientific analysis and weighing of such data determine with accuracy and precision the results which may be expected from future operations under given normal conditions. In other words, it is his duty, after having made a careful and accurate survey, to draw deductions and present conclusions and having done so to have faith in them and to preach them.

There is no doubt in my mind, that as commercial statistics have revolutionized commerce, so industrial statistics carefully collected, compiled, tabulated and scientifically analysed and applied would materially benefit the manufacturing industries. This morning's papers supplied us with quotations not only as to the prices of stocks and bonds but also of the supply of wool, cotton and foodstuffs immediately available for human consumption or in warehouses, elevators or afloat. Why should there not be as good information available regarding the supplies and probable requirements of any of the manufactured products? It may be available but I am not aware of it.

The annual reports of our great business organisations should be as fully presented and be as trustworthy and impartial as a Government report. Only such reports can be useful to the producers themselves. The industrial statistician could deal, as the Census Office cannot, shall I say, dare not, with the wage problem of the day-rate, the weekly rate, the piece rate, which are often utilised in the same mill, and thus determine the factors which tend to show the average number of employees in each industry, the average earnings and the actual relative share of employer and employee in the increment of the industry.

Few of us are capable of thinking in the high numbers but we can all readily comprehend such figures when presented in relative and comparative percentages.

Until such time as the Federal Government will undertake to collect, tabulate and publish annual statistics of manufactures, the various associations should have for their own use at least such data readily at hand. It is only by such means that it can be known with any degree of accuracy the quantity and value of articles produced, the aggregate and average wages paid, the total production and the quantity of it

distributed, the relationship which the cost of raw material bears to the cost of manufacture as represented by the cost of plant, visible working capital, cost of labor and transportation.

Census statistics as presented in the twenty tables in the volumes of the Census dealing with Manufactures gives, I think, as fully as such statistics should the various facts relating to the different industries. The aim of census statistics where many phases of national stocktaking are dealt with is to present general results. But in addition to the information concerning capital, employees whether inside or outside workers, day or piece workers, fuel, cost of raw materials, etc., there should be available information regarding the cost of distribution, extent of depreciation, renewal charges, interest charges, etc., before it can reasonably be demonstrated whether the industry is making abnormal profits or only such a net profit as every individual or corporation should derive from ventures which depend on the fluctuations of the commercial barometer, that is to say, a fair average percentage

over and above the current interest obtained from stable investments such as consols or gold bonds. We all admit we ought to have these statistics, it is not always so easy to obtain them. Then we should have the statistics relative to ages of the employed, their social habits in regard to temperance, etc. We may as well own up to it we have deliberately created industrial and social conditions which make the living wage a burning issue, and one which will require skilful handling so as not to, while giving the employee his dues, real or imaginary, cripple the employer to such an extent that he may find it more to his advantage to close his works or curtail his output than submit to undue exactions and thus create a condition and produce a result which, instead of removing a grievance will react disastrously in a greater or lesser degree to both parties. But there is no need of anticipating any dire consequences for statistics have appeared on the scene and in unequivocal terms show where the basis of compromise is to be found and lead all parties into the "via media" of equity.

PAPER AND PULP MANUFACTURERS CENSUS, 1911 AND 1901

	No.	Capital. \$	Wages. \$	Materials. \$	Product. \$
Pulp and Paper 1911	79	54,718,415	5,162,150	11,125,794	23,732,556
Pulp and Paper 1901	56	19,301,919	2,405,150	3,711,764	8,774,647
Increase Total	23	35,416,496	2,756,884	7,414,030	14,957,909
Increase p. c.	..	183.48	114.61	199.74	170.46
Av'ge per establishment 1911	..	692,638	65,344	140,833	300,412
Av'ge per establishment 1901	..	344,676	42,952	66,281	156,590
Card Board 1911	7	831,482	104,143	251,607	506,077
Card Board 1901	3	235,540	34,461	73,907	147,000
Increase Total	7	15,596,741	69,682	177,700	359,077
Increase p. c.	..	253.01	202.20	240.43	244.27
Av'ge per establishment 1911	..	118,783	14,878	35,944	72,297
Av'ge per establishment 1901	..	78,513	11,487	24,636	49,000
Paper 1911	35	23,104,560	2,895,717	6,510,886	14,109,014
Paper 1901	28	7,507,819	1,191,038	2,170,770	4,380,776
Increase Total	..	15,596,741	1,704,679	4,340,116	9,728,238
Increase p. c.	..	207.73	143.12	199.93	222.06
Av'ge per establishment 1911	..	660,130	82,735	186,025	403,114
Av'ge per establishment 1901	..	268,136	22,537	77,528	159,313
Wood Pulp 1911	37	30,782,373	2,162,290	4,363,301	9,117,465
(All processes) 1901	25	11,558,560	1,179,807	1,464,087	4,246,871
Increase Total	12	19,223,813	892,483	2,899,214	4,870,594
Increase p. c.	..	166.31	83.27	198.02	114.68
Av'ge per establishment 1911	..	831,956	58,440	117,927	246,417
Av'ge per establishment 1901	..	462,342	45,192	58,563	169,875

This table, limited in scope and presentation of facts as it may be, yet indicates that the paper and pulp manufactures are in a healthy progressive state. In 1901 a population of 5,371,315 made it possible to profitably produce \$8,774,647 worth of paper and pulp, while in 1911 for a population of 7,206,643 the production aggregated \$23,732,556. The gain in population in the decade was 13.36 per cent and in pulp and paper production 170.46 per cent. What has made possible such tremendous expansion? If the increased population had used paper and pulp only in the same ratio in 1911 as it did in 1901 the value of the product required would only reach 12 million dollars, or if we confine our review to paper only 6 million dollars' worth instead of 14 millions would have sufficed. Statistics furnish the key to the solution of the question by

the presentation of evidence regarding not only increase in population, better education, migration, improved social conditions made possible by higher wages. These all contributed to the result and enable us to make a comprehensive survey of all conditions which made possible such an expansion, and from statistical premises to determine logically, that is to say in terms of figures to what an extent further development is warranted.

The table also enables us to see at a glance that cost of labor and materials have increased in about the same proportion as has the value of production. The cost of labor alone increased by \$22,392 per plant or 52 per cent from 1901 to 1911. The average wages per person of the 6,361 persons in 1901 employed in the production of pulp and paper was \$378 as com-

pared with an average wage of \$517 for 9,996 persons in 1911. A further deduction from these statistics is, that the net proceeds for the whole industry (excluding depreciation of plant, renewal charges, etc.) was 13.6 per cent in 1911 and 13.7 per cent in 1901.

Statistics enable the manager to satisfy his shareholders that things are well conducted. It may be said, that dividends will do this. I have known excellent returns to reach shareholders from the sale of bonds or by the sale of a block of reserve stock. Bare, cold, unbending statistics alone will demonstrate whether the industrial craft ought to be beached to prevent a wreck in mid-ocean or whether she is fitted to weather the gales to the haven of success. Statistics enable the nation, in a larger and more comprehensive manner than is perhaps possible in smaller affairs, to take stock and plan for the future. It is, I think, an

undeniable fact, the British statesman to the contrary notwithstanding, who declared that "There were lies, damn lies, and statistics," that by figures only can the true financial, commercial and social conditions be expressed in unbiased terms. Figures are truthful things and ought to be so handled.

But great as has been the progress of production in the pulp and paper industry between 1901 and 1911, statistics show us that the progress, although excellent did not keep pace with demands. In 1909 we imported paper and paper goods to the value of \$3,581,807, in 1910 the value was \$4,580,282, in 1911 it reached \$5,454,910, in 1912 like Bruce's spider, it climbed higher still, reaching \$6,259,896, while in 1913, emulating, no doubt, the high cost of living it scaled the height of \$8,194,025.

Value of Paper, all Kinds, Imported Into Canada From All Countries During the Five Fiscal Years Ended March 31st, 1909-1913.

	1909. \$	1910. \$	1911. \$	1912. \$	1913. \$
Albumenized and other papers and films chemically prepared for photographers' use	102,508	134,558	159,204	201,665	204,921
Bags of sacks printed or not	26,379	28,493	29,171	55,725	52,225
Cards for playing	64,842	78,204	83,344	109,575	129,838
Card board not pasted or coated	20,992	26,877	42,447	70,045	82,066
Envelopes	56,837	79,245	84,573	91,268	117,080
Felt board	40,533	8,907	7,205	7,122	11,700
Hangings of wall paper, including borders	217,158	274,991	313,051	343,100	467,759
Leather board, leatheroid and manufactures of	20,536	32,777	26,930	47,521	50,915
Mill board not coated or pasted	50,872	49,098	74,645	58,739	100,009
Union collar cloth paper in rolls or sheets, glossed, finished or not	1,571	2,532	2,029	1,042	1,837
Pads not printed, papier mache ware . .	7,884	6,225	2,718	10,542	8,468
Paper, manufactures of, not otherwise provided for	1,051,424	1,327,799	1,569,087	1,821,936	2,482,760
Paper matting when for use in Canadian manufactures . . . . .	.....	.....	.....	.....	890
Patterns, boot and shoe, manufactures of paper	6,455	2,599	9,730	23,051	15,163
Printing paper (for newspapers) in sheets or rolls valued at not more than 2¼ cents per pound . . . . .	.....	41	56,486	146,258	152,160
Printing paper not otherwise provided for	374,502	462,212	631,810	616,372	644,131
Ruled and border and coated papers, boxed papers and papeteries	100,381	168,567	221,402	300,161	328,777
Straw board not pasted or coated	25,238	28,744	54,669	61,221	108,271
Tarred and other building papers, not otherwise provided for	294,664	345,795	396,083	470,944	687,577
Window blinds of paper of all kinds . .	.....	115	593	194	505
Wrapping paper	77,666	88,453	96,247	138,958	221,746
All other kinds	1,041,365	1,434,050	1,605,486	1,684,456	2,325,227
Totals	3,581,807	4,580,282	5,454,910	6,259,896	8,194,025

Our exports of paper were, in 1908, \$3,503,298, \$3,469,713 in 1909; \$3,156,096 in 1910; \$3,912,196 in 1911; \$3,867,119 in 1912, and \$6,324,810 in 1913. Having the labor, the natural resources, and accessible markets, why we need to import so heavily is a question for statistical investigation. I am aware that there are other factors which control the movements of trade, such as the supply of raw material, cheap power, proximity of markets and their capacity. All of which, to be

convincingly and intelligently comprehensive, must be expressed in figures.

To summarise. Statistics are the only means by which we may determine the movement of population from the country to the city or from one part of the country to another, the extent of immigration and emigration. They enable us to ascertain with precision and accuracy the social conditions of the people as evidenced by the percentage of illiterates to the

total population and as to whether there is an upward trend as shown by comparative statistics of school attendance extending over a period of years. Statistics of education and naturalization are particularly useful in determining to what extent the foreign born may be considered a constant factor in the future development of the country—the first is valuable as showing whether the children of the immigrants are attending school and being fitted for the duties of citizenship, and the latter whether the immigrants of voting age are assuming the responsibilities of citizenship, or are simply leeches on the body politic. It may be said that they give labor for money. What we want in Canada is a stable educated population, not wayfarers.

Statistics of wages and earnings enable us to comprehend the purchasing power of the people and knowing their improved financial status cater to that prosperity with a better class of goods. The quality of newspaper used is evidence of culture.

Statistics of transportation indicate the strength of

the currents of trade and also the relative development of land and water transportation facilities.

In agriculture they show whether the possibility of adequate supply of food for man and beast is being maintained and whether under present conditions the proportion of production to consumption is likely to be sufficient for the needs of the future increased population.

To the manufacturer a knowledge not only of administrative statistics but also of scientific statistical research is necessary. He must take into account the past and present conditions of population, agriculture, transportation, and by a comprehensive survey of the whole as presented in a concrete form learn the lessons which they teach regarding the prospects of future developments and the bearing which they have on the problem of raw supply, manufacture and distribution. In the words of Levasseur "statistics illumine the footsteps of the future by an exact knowledge of the past," and to that end I would ask your hearty co-operation in the work of collecting Census Statistics.

THE RELATIONSHIP OF MOISTURE AND PAPER

By E. SUTERMEISTER.

(Written Specially for Pulp and Paper Magazine.)

The interrelation of moisture, paper, and atmospheric humidity has never been given sufficient attention in the paper industry in spite of the fact that it is of vital importance to every manufacturer and user of this product and in spite of the fact that lack of attention to this matter is the cause of many a failure in the press-room. In this paper it is proposed to discuss a few of the more important ways in which moisture affects paper and to show how great is the importance of considering such problems, both to the paper maker and to the printer.

Previous Investigations.

It is a well known fact that paper contains more moisture in a humid atmosphere than in a dry one. On a damp day it feels limp and rag-like, while in dry weather it has snap and rattle, the difference being entirely due to the difference in its moisture content. The extent of such variations was shown a number of years ago by Prof. Dalen who published the results of moisture determinations on fourteen papers at relative humidities varying from 30 to 100 per cent. It is unnecessary to quote his results in full, but it may be stated that at 30 per cent humidity the papers contained 2.3 per cent to 3.6 per cent of moisture while at 90 per cent humidity they contained from 10.2 per cent to 15.1 per cent. The papers which he examined included writing, printing, wrapping, hand-made and Japanese papers and the fibrous stock and sizing varied widely enough so that the collection may be considered fairly representative of the whole field of paper products, with the possible exception of coated papers. Recent tests by the author on a number of book, offset, and coated papers, show in a general way a fair degree of conformity with Prof. Dalen's results though there seems to be a tendency for coated papers, particularly those containing satin white, to retain more moisture than uncoated papers.

Quite recently von Roessler published the results of moisture determinations in a large number of pa-

per half-stuffs at relative humidities ranging from 10 per cent to 90 per cent. Up to 60 per cent humidity practically all of these contain more moisture than the papers tested by Prof. Dalen, but beyond that point the moisture in the paper increases much more rapidly than that in the half-stuffs. Von Roessler's results show that the moisture content varies very nearly in proportion to the relative humidity, but that different materials retain different amounts of moisture.

Importance to Manufacturers.

The relation of these results to actual manufacturing operations may be seen when a few moisture tests on actual mill products are considered.

	Moisture.
Antique paper taken from roll contains.	3.3—4.1%
Super paper before calendering contains.	3.7—6.7%
Super paper after calendering contains.	2.7—4.2%
Coated paper after calendering contains.	2.8—3.0%
Coated paper uncalendered contains	4.4—8.1%
Miscellaneous papers of unknown grade contain when ready to ship	2.7—4.7%

These papers not only show wide variations, but many of them, when compared with Prof. Dalen's averages, will be seen to contain considerably less moisture than they should unless the atmospheric humidity is assumed to be as low as 30-40 per cent.

To see how the humidity varied in a manufacturing establishment having a fair system of ventilation, but no means of controlling the humidity, observations were taken at frequent intervals during a period of eighteen months. The hygrometer used was of the wet and dry bulb type so placed that it should be subjected to a good circulation of air at all times. These records showed that the relative humidity varied from 30.5 to 70.9 per cent and averaged about 52 per cent. During this period the maximum observed change in humidity from one day to the next was 26 per cent, and within a space of two days 30 per cent. Undoubtedly greater daily variations than this are occasionally

met with, and must be reckoned on in calculating the advantages to be gained in controlling the humidity.

Considering now a paper which leaves the paper machine with a moisture content of about 4.5 per cent; on super-calendering this will be still further dried out, probably down to about 3.0 per cent moisture, and if it goes through the winding, cutting or sorting process and is packed on a very dry day it will probably leave the mill with very little over 3 per cent of moisture. In a part of the same order there may be a roll which left the machine with 6 per cent of moisture and by being handled on a damp day reached the end of the process with fully 5 per cent remaining. These two rolls certainly could not be expected to work the same in the press-room and the chances are that such variations in moisture on leaving the machine would cause other variations in the finished product which would be more serious than the actual difference in moisture.

If paper is too dry when it leaves the machine it is brittle and apt to break on calendering and it does not readily take a high finish. If on the other hand the paper is insufficiently dried on the machine it is apt to crush and blacken on the super-calenders, while at the same time, taking a higher finish than is desired. Between these two extremes lies the middle path which it is desired to follow, and the following of which is usually left to the skill and care of the machine tender. He may be the most painstaking man in the world, and yet there will be times when paper which is too dry or too moist will get by him and cause trouble further down the line. Obviously a practical method of controlling the drying of paper so as to keep its moisture content uniform at any given point is much to be desired. This has been attempted by various devices to regulate the steam entering the driers according to the tension of the paper, which is dependent on its dryness. Other apparatus has been designed to accomplish the same result by keeping the temperature of the driers at a constant point. Either of these methods is a distinct improvement over the old idea of hand regulation, but it is confidently predicted that still better methods can be devised.

Even if paper could be turned off from the machine with a perfectly uniform amount of moisture, it does not necessarily mean that it would be in equilibrium with atmospheric conditions at the time it is shipped, for it is frequently sent out very soon after super-calendering and before it has had a chance to take up its normal amount of moisture. If very dry paper is shipped in rolls the absorption of moisture may make it expand sufficiently to cause wrinkles or in very bad cases, the rolls may even burst, while if cut in sheets and cased the paper is likely to wrinkle and cockle through uneven absorption of moisture with consequent trouble to the pressman. Moreover such paper cannot be taken directly from the cases and printed but must be stored in the pressroom, best in thin layers on racks, before it can be handled satisfactorily.

Such trouble as this can never be overcome entirely unless all printing houses maintain a definite humidity in their pressrooms, and all paper is sent out containing the moisture which it should at this humidity. This can probably never be accomplished, but it is at least an object to be worked for and approached as nearly as possible. Even if the paper manufacturer alone could fulfill his part of the program by sending out paper which would be in moisture equilibrium with an atmosphere of the average humidity it would be a distinct gain from the standpoint of the printer, since it would give him a more uniform product to

work with. It would also exonerate the manufacturer from blame in many cases in which he now receives complaints, and last, but not least, the paper could be used with little or no storage in the pressroom since it would be already seasoned before shipping.

In the opinion of the writer any scheme for producing uniformly humid paper will involve the control of the humidity in the rooms in which the paper is stored or finished. This should probably include the calender room, the winding room for roll papers and the cutting and sorting rooms for sheet papers. By maintaining a comparatively high humidity in these rooms much could be done toward improving the condition of the paper before it leaves the mill.

Importance to Printers.

Let us now try and look at this question of humidity and paper from the point of view of the printer.

When he receives a case of paper it may be either damper or drier than the surrounding atmosphere would call for. If it is damper it will lose moisture when taken from the case, and as this loss takes place most rapidly on the edges they will shrink more quickly than the centre which will consequently become baggy. If such paper is printed in this condition the press works the fullness to one side and the result is frequently a wrinkle or cut which spoils the job. If the paper when taken from the case is too dry it must absorb moisture, and as this change also takes place most quickly on the edges, they expand more rapidly than the centre of the sheet and become wavy. Paper in this condition also is almost impossible to print with good results. These two points illustrate the necessity of racking the paper, or exposing it to the atmosphere of the pressrooms sufficiently long for the moisture to adjust itself throughout, and they also show what an advantage it would be to the printer if he could receive paper of a uniform moisture content.

It might be mentioned in this connection that the paper manufacturer is not always to blame for variations in the moisture in the paper since that which is sold through dealers is often stored in warehouses long enough to materially alter its condition. So far as the writer knows no attempt is made to hold paper in warehouses at a constant humidity nor is any particular care exercised in delivering the goods to the printer. If a case or roll is carted through the streets exposed to the sun on a hot summer day, it is not to be expected that the hot and cool sides of this case or roll would print just alike if used at once. It is probably not wholly a question of temperature either since the part exposed to the sun must become dryer due to the increased capacity of the heated air surrounding it for taking up moisture. Again we see why the wise printer insists on having the paper in his own shop for at least several days before he expects to use it.

Another way in which moisture seriously interferes with the printer is in its effect on the size of the paper. It is a well known fact that paper expands and contracts according as the moisture in the surrounding atmosphere increase or diminishes, and it is such changes in dimensions which cause nearly all of the cases of poor register. This fact is of extreme importance in color work, where the same sheet is printed several different times at intervals of several days, and where it is very essential that the different impressions should fall directly over one another. While many printers recognize changing humidity conditions as one of the prime causes of misregister, this is by no means true of all, and even in the larger and more progressive establishments there is no adequate attempt at its con-

trol. While it is possible to regulate the humidity within limits, the equipment required is quite costly, and rather than go to the necessary expense, most printing houses prefer to take a chance on the results. If it so happens that the humidity at the second printing is about the same as at the first impression good register generally follows, but if there is much difference in the humidity at the two printings then misregister is pretty sure to result even with the best of paper. In a shop where no humidity control is attempted nor any record kept of its daily variations, it is obvious that good work, so far as register goes, is largely a matter of luck.

The closeness with which two or more impressions should register depends on the type of work being done; for some jobs if they come within one one-hundredth of an inch it would be sufficient, while for other work the register should be practically perfect. It is obvious that the closer the register the better will be the result. The dimensions of the sheet handled have a considerable influence on the permissible expansion, as will be readily seen by considering the case of two sheets, one 25 x 38 and the other 40 x 60 inches. If these have the same percentage expansion with changing humidity the results as to misregister will be quite different. If we assume a change in linear dimensions of 0.8 per cent, the first sheet would change in its longest dimension 0.3 of an inch, while the other would increase or decrease in length by 0.48 of an inch. This is an extreme case, but it illustrates the point that the percentage expansion which can be permitted in a paper depends on the size of the sheet used as well as on the grade of printing being done and shows that the larger the sheet the less satisfactory will be the register.

Very little work showing the influence of humidity changes on the dimensions of paper is on record. Prof. Dalen in 1895 published the measurements of three samples of paper at humidities ranging from zero to 100 per cent. He found the expansion much greater in the crosswise than in the lengthwise direction, and the maximum change which he recorded was 1.4 per cent of the length at 65 per cent humidity. He showed that the influence exerted by changing temperature was very slight when compared with that of humidity and found that when exposed to humidities over 80 per cent paper undergoes a slight permanent expansion. K. B. Lamb, in a recent technical journal published his observations on a number of papers which he measured at 0 per cent, and 100 per cent humidity. He found the maximum expansion under these conditions to be 1.42 per cent in the crosswise direction and 0.73 per cent lengthwise.

Original Investigations.

As these results did not appear to cover the ground as fully as seemed desirable, the author recently undertook the examination of a considerable number of samples of book, offset, and coated papers. The apparatus used was practically the same as that employed by Prof. Dalen. It consisted of a double walled galvanized iron box, 13 x 18 x 5½ inches inside measurements, fitted with a plate-glass cover which could be made tight by means of putty. Inside the box, at one end, were two jars, one for sulphuric acid, the other for water, and at the other end was placed a wet and dry bulb thermometer-set for recording the humidity. The covers of the acid and water jars could be raised and lowered by glass rods which passed through corks in holes in the plate-glass cover, and by this means any relative humidity between 29 per cent and 96 per cent could be maintained. In the centre of the plate

glass was a hole through which a rod supporting a brass scale protruded; over this rod was slipped a rubber stopper whose flat under side made a practically air-tight contact with the glass. By means of this rod and scale the paper, which was placed on a glass plate directly under the centre hole, could be measured at any time without disturbing the humidity conditions inside the box. A good circulation of air in the chamber was kept up by a small fan whose shaft also extended through the plate glass cover.

In using this apparatus cross-shaped pieces of paper were cut so that distances of 280 m.m. could be marked off both across and with the grain. Two of these were placed on the glass plate so that all four measurements could be made by turning the scale. After making the cover tight the fan was started and the humidity run down to 29 per cent by absorbing the moisture in the concentrated sulphuric acid. Measurements of the distance between the marks were now made at intervals and when no change in length was observed after an hour's exposure to 29 per cent humidity, it was assumed that equilibrium had been reached. The next measurement was made in a similar way after the humidity had been brought up to 60 per cent, a third at 80 per cent and the final reading at 95 per cent relative humidity. The temperature during the tests was that of the room and ranged from 66 deg. to 89 deg. F.; the greater part of the observations were made, however, within much narrower limits.

In order to make sure that the four humidities selected for observations were about the conditions desired, three samples of paper intended for offset printing were measured at a large number of points. The following table gives the conditions and the percentage expansion based on the length at 29 per cent relative humidity.

Percentage Expansion.

Humidity change.	Paper 1.		Paper 2.		Paper 3.	
	Length	Across	Length	Across	Length	Across
29—40%	0.0357	0.1072	0.0718	0.1436	0.0719	0.1796
40—50	0.0357	0.1071	0.0358	0.1437	0.0719	0.0718
50—60	0.0357	0.0715	0.0360	0.1077	0.0719	0.1076
60—70	0.0358	0.0713	0.0359	0.1077	0.0375	0.1078
70—80	0.1429	0.1070	0.1794	0.2873	0.0702	0.2872
80—87	0.0356	0.2143	0.0717	0.1800	0.1078	0.2155
89—97.5	0.1427	0.4656	0.2509	0.8620	0.2563	0.7905
29—97.5	0.4641	1.1440	0.6815	1.8320	0.6875	1.7600

From a consideration of these results it was evident that the points selected for readings were well chosen, and these four original humidities were adhered to for all other tests.

Studying next a number of papers which were known to print either well or poorly, the following results were obtained:—

Percentage Expansion Between

Paper	Prints	Length Across		Length Across		Length Across	
		20 & 60%	60 & 80%	80 & 85%	85 & 95%	95 & 100%	100 & 105%
4	well	0.1430	0.2148	0.1789	0.2859	0.2856	0.6443
5	poorly	0.1364	0.2507	0.1818	0.2505	0.2273	0.5378
6	poorly	0.1786	0.3828	0.1785	0.3822	0.2141	0.7230
7	poorly	0.1786	0.4651	0.1427	0.3934	0.1428	0.8955
8	well	0.1430	0.3578	0.1430	0.3923	0.1070	0.5729
9	well	0.1785	0.2854	0.1070	0.3214	0.0715	0.5352

Of these papers 4 and 5 were coated, while 6 to 9 inclusive were made for offset work.

It is very evident from a study of the figures that the poor printing results cannot be laid entirely to the excessive expansion of the paper since other papers with equally great changes in dimensions print well. There does appear, however, to be a tendency for the satisfactory papers to expand less than the poor ones, but the difference is not so marked that a test of this nature could be applied to indicate before hand whether a paper will print well or not. These figures tend to strengthen the opinion already expressed that good register is largely a matter of luck in the pressroom.

The next point which it was attempted to investigate was the influence of the coating and calendering process in the manufacture of coated papers. Three different grades of paper were selected and the expansion determined before coating, and again after coating and calendering. Papers 10 and 11 contained satin white in the coating, while sample 12 contained clay only; all were casein sized.

Percentage Expansion Between

	29 & 60%		60 & 80%		80 & 95%	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Paper 10						
Uncoated	0.1074	0.2506	0.0715	0.1423	0.1430	0.4301
Coated	0.1074	0.2506	0.1429	0.3219	0.2504	0.6085
Paper 11						
Uncoated	0.1074	0.2862	0.0715	0.3578	0.1072	0.5740
Coated	0.1431	0.2862	0.1073	0.4298	0.2503	0.7880
Paper 12						
Uncoated	0.1431	0.2870	0.1075	0.2151	0.0714	0.5739
Coated	0.1789	0.2870	0.1072	0.2151	0.1789	0.5739

It is evident from these tests that coating may or may not increase the percentage expansion over that of the plain paper. Whether the presence of satin white is the determining factor, it is impossible to say with certainty, but it is a peculiar coincidence that the two papers containing satin white expand more after coating, while that with clay only, shows hardly any increase. The difference is, however, not very serious in any case, especially below 80 per cent relative humidity, and taking into account the total expansion of the papers it would seem as though the slight extra expansion caused by the coating might be considered negligible.

It is often stated that paper which has been well seasoned prints with less trouble than when first made. To see whether this could be caused by a decreased percentage expansion after the paper had been seasoned two samples of offset paper were tested when first made and again at the end of three months, during which time they had been exposed to all atmospheric changes of an occupied room.

Percentage Expansion Between

	29 & 60%		60 & 80%		80 & 95%	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Paper 13						
April 17	0.0715	0.3935	0.0715	0.3935	0.1073	0.8230
July 20	0.2152	0.5025	0.1440	0.2875	0.3233	1.0790
Paper 14						
April 17	0.1431	0.3936	0.0716	0.3577	0.1789	0.7517
July 20	0.2155	0.5020	0.1436	0.3590	0.2512	1.0770

These tests show an unmistakable increase in the percentage expansion at the end of three month's storage, and while no reason can be assigned for this be-

havior, it is evident that the superior printing qualities of seasoned paper cannot be attributed to any decreased tendency toward changes in dimensions with varying humidities.

During this test it was noticed that samples of paper which had been exposed to 95 per cent humidity and allowed to come back to room conditions had decreased in length both with and across the grain. This seemed to be a frequent occurrence, as a considerable number of samples were found to act in this way. To see whether the total change in dimensions took place on once bringing to 95 per cent humidity and allowing to dry out again, three samples were selected and measured first at 29 per cent relative humidity. They were then brought up to 95 per cent humidity, and again measured and this alternate measurement at 29 per cent and 95 per cent was repeated till the papers ceased changing in dimensions. The results of these measurements are as follows:—

Measurements in Millimeters.

	Paper 15.		Paper 16.		Paper 17.	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Humidity.						
1st at 29%	279.5	279.1	279.3	278.6	279.3	279.0
1st at 95	280.7	282.0	280.7	282.7	280.9	282.3
2nd at 29	279.0	278.7	278.9	278.1	278.9	278.5
2nd at 95	280.4	281.9	280.4	282.2	280.8	282.1
3rd at 29	279.0	278.7	278.9	278.2	278.8	278.7
3rd at 95	280.2	281.7	280.4	282.1	280.7	282.1
4th at 29	279.0	278.7	278.8	278.1	278.8	278.6

The permanent contraction does not all take place on once exposing to 95 per cent humidity and again drying out, but the shrinkage on treating this way a second time is very slight. This permanent change appears to be slightly less in the crosswise direction than it is lengthwise, but both are of sufficient magnitude to cause serious trouble in register if the change is caused to take place. With a paper having this tendency it might, if it were used in a process which required the paper to be dampened, absolutely prevent good register. In all cases where the paper is to be moistened it would be a wise precaution to see that this permanent change has been brought about before the first impression.

Conclusions.

The conclusions which were reached from this investigation were:—

With changing humidity the crosswise dimensions changes much more than the lengthwise, but there is no constant relation between the two.

Between 29 per cent and 70 per cent relative humidity the rate of expansion is practically proportional to the rate of change in humidity, but above 70 per cent the expansion becomes much more rapid.

There seems to be no fixed or definite connection between the extent to which humidity affects the paper and the success with which it prints.

Coating in most cases slightly increases the effect of humidity on the dimension changes, but the increase is not enough to be serious.

Seasoning does not diminish the effect of humidity changes on the paper.

Many papers when exposed to 95 per cent humidity and again dried out undergo a permanent shrinkage which is of sufficient magnitude to be serious if it takes place between two impressions.

Paper which has undergone this permanent shrinkage shows the same percentage expansion when submitted to the usual tests.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

ORVILLE H. MOORE

General Manager of the Hinde and Dauch Company, Toronto

Any one who has even a nodding acquaintance with the pulp and paper industry of Canada, has heard of the famous Moore Rotary Screen, but it is perhaps not generally known that the inventor of this, the Adirondack Horizontal Screen, and other machines, is now one of the leading members of the trade in Canada. He is Orville H. Moore, General Manager of the Hinde and Dauch Paper Co., of Canada, Limited.



Just five years ago, in a small upper flat at the foot of Dufferin Street, Toronto, the company began manufacturing corrugated boxes and specialties. They then occupied only about 2,500 square feet of space. From the day that their double facing, corrugated and corner cutting machines were put in operation, business, under the direction of Mr. Moore, started to expand, and a year later larger premises had to be secured. A former wall paper factory, offering larger capacity, was acquired on Hanna Avenue; still the business grew, but to trace its development to its present large proportions would be too long a story. Now over one hundred thousand square feet of floor space is utilized. A year or so ago a large and well-equipped board mill was completed and a 24-inch machine in-

stalled, with a capacity of forty tons per day of all kinds of box board; together with six, 200-pound beaters, four Jordans, two large rotary printing presses and a complete composing outfit. A steel and concrete building, of mill construction, 265 x 60 feet, four storeys high, was erected to house the plant.

Progress did not even end here. Another forward step has just been taken. A large addition has been erected, 160 x 40 feet, in which a combination pasting machine—the first of its type in Canada—for making wall board, fibre board and fibre boxes, has been placed and will soon be in operation. This machine, built by the Downington Manufacturing Co., of East Downington, Pa., is 100 feet long by 80 inches wide, and has a capacity of twenty tons per day. In the production of the new lines, jute, chip and filled board will be used. Another 150 horse-power boiler has also been added making four in all.

In the making of corrugated boxes and containers of every kind, box board, pasted board, etc., the Hinde and Dauch Co. of Canada, have established a business that extends from coast to coast, having selling agencies in Vancouver, Winnipeg, Montreal, St. John and other cities. Their box plant alone consumes daily about thirty tons of jute, chip, filled and straw board, all being manufactured on the premises with the exception of straw board.

The company have invested in the last five years fully half a million dollars in plant and buildings and, to the fine showing that has been made, a generous share of the credit must be accorded to the subject of this sketch.

Although on the sunny side of forty, Mr. Moore has been associated with pulp, paper and board mills for the last twenty-seven years.

Born in the little town of Fort Edward in New York State, and surrounded by pulp and paper mills, he soon imbibed their atmosphere. He has won his way to the front by ability, industry and application. His father, a state bridge inspector in New York State, met death when the son was only nine years of age, thus young Moore was thrown on his own resources. He went to school in winter and spent his summers on a farm until he was thirteen. His first job in his life-work was in the rag room of the Glen Falls Co., now part of the International Paper Co. There he carried rags from the dusting machine to the rotary cookers. It was a dirty, dusty task—so disagreeable that he worked with a wet sponge in his face to keep the flying particles out of his mouth and nose. At other times on cold winter nights he was sent out with a rake to keep the anchor ice away from the racks so that they would not become clogged and stop the beaters, but he never complained, although often compelled to put in fourteen and eighteen hours a day. Being a husky lad he came in for much heavy labor. After becoming a back tender on one of the machines, he went over to the Howland Paper Co., of Hudson Falls, N.Y., which to-day is one of the plants of the Union Bag and Paper Co. There he was a machine tender for a number of years in the making of jute and bag

papers. He was sent to Hadley, N.Y., being promoted to the position of superintendent of a three-machine mill of the company, turning out bag paper, and also had charge of the erection of the machinery in connection with starting a ground wood plant for the same concern at Fennimore, N.Y.

During these years he had made a close study of pulp and paper mill equipment, and all his leisure time was spent amid drafting boards and blue prints, for he never tired of mechanical appliances. This pursuit was his hobby and delight. Steady progress was made, then one day after the patterns had been built, the patents secured in both the United States and Canada, the Moore Rotary Screen was heard of throughout the continent. It marked a distinct advance over anything that had ever before been placed on the market and its success from the outset was assured. Its action was vertical, its force centrifugal, its capacity large, its refining characteristics admirable while the power required to operate it was much less than that of any other screen that had been invented. Its efficient work and economical operation were soon recognized, many leading pulp mills of the country installing the screen. The inventor resigned his position and took up the sale of his patent paying numerous visits to Canada where sales were made to Clergue Mill at Sault Ste. Marie, Brompton Pulp and Paper Co., Clark Bros. and Co., Spanish River Co., Canada Paper Co., Montmagny Pulp and Paper Co. and others. The screens are in use to-day in these plants. Later Mr. Moore invented the Adirondack Horizontal Screen, operated by a propelling force, with a system of fans which has also met with considerable success.

After spending some four years in the interest of his inventions, he sold out his entire rights in the Moore screen to the Friction Pulley and Machine Works of Hudson Falls, N.Y., and next became secretary and manager of the Progressive Pulp and Paper Co., remodelling their plant at Lake Champlain, and building a new mill for the Lake Champlain Pulp and Paper Company at Plattsburg, N.Y., being the organizer of both these concerns. He then joined forces with the Dexter Sulphite and Paper Co. of Dexter, N.Y., and was manager of manufacturing in their Mitscherlich and ground wood mills, and two paper mills, which post he filled for several years. In 1908 he became identified with the Hinde and Dauch Paper Co., whose headquarters are at Sandusky, Ohio. They operate seven corrugated paper box factories and five board mills. Mr. Moore was sent to Hoboken, N.J., to take charge of the plan there, owing to the illness of the superintendent.

It was about this time that the company, which had been doing a large business in their line in Canada, decided, like many other progressive American concerns, to establish a factory in the Dominion, and Toronto was selected as the location. In January, 1909, Mr. Moore came over and shortly had a corrugated box plant under way. The following year the Hinde and Dauch Paper Co., of Canada, was incorporated with a share capital of four hundred thousand dollars, and while it has a working arrangement with the parent concern in Sandusky, it is in operation and management a separate organization in which Canadian capital is largely invested. For some time Mr. Moore looked after sales as well as administration and production, but the duties became too heavy and the volume of business so large, that the selling end was made a separate department three years ago.

Personally, Mr. Moore is of a most genial disposition, and optimistic temperament. He has always

taken infinite pleasure in the work with which he is associated and found his chief recreation amid mills. He loves to visit manufacturing plants, study machinery, transportation facilities and power problems. The bent of his nature may be well gauged from his first visit to New York City when a mere youth. He was a member of the volunteer fire brigade of Fort Edward, and one day the company was invited to the metropolis to participate in tournament before the Governor of the State. After the fancy drill was executed, the members scattered to see the city, their tickets being valid until the end of the week. Young Moore was not interested in Broadway, Coney Island, the Bowery or Wall Street, but spent days around the docks and railway depots, taking in every detail of shipping, loading, hoisting, etc. Then at midnight on Saturday, a few minutes before the time limit of his ticket lapsed, he boarded a train for home with only a penny in his pocket. He has always devoted his spare moments to mechanical pursuits, and in connection with the erection of the company's splendid board mill in Toronto, all the interior lay-out, offices, manufacturing departments and installation of the equipment represent the work of the General Manager, whose constructive and mechanical genius is such that he might almost be styled a pulp and paper mill engineer. Fraternally, Mr. Moore is a member of the Masonic Order and a Mystic Shriner. For recreation he occasionally takes spins in his automobile, but he would rather spend an hour in the garage taking the chassis apart and re-assembling it than to ride all day over rural roads or town thoroughfares at immoderate speed.

MANUFACTURE OF DARK-COLORED PAPERS.

When making better kinds of dark-colored papers in many cases it is sufficient to take unbleached or half-bleached pulp instead of bleached pulp. One thereby saves not only the bleaching agent, but also the dye requisite for giving the paper the required dark shade. Further, unbleached fibres have a greater affinity for dyes than bleached.

A very frequently required tint is, e.g., a brownish Bordeaux; this is best obtained by employing unbleached soda cellulose and a combination of Bordeaux and brown.

Deep red tints and also deep green and olive tints which are now frequently required are likewise preferably made from unbleached pulp.

In most of these papers (paper covers of catalogues, passe-partout, covers of files, better kinds of wrapping paper, etc.), fastness to light is important. This is obtained by employing mineral colors, but against their employment is the fact that they readily render paper flabby or limp when a certain limit is exceeded; also, it is not possible so to fix mineral colors that they do not come off when the paper is rubbed. Therefore, it is preferable to employ so-called substantive aniline dyes which are put on the market under various names, such as diamine, diamine genuine dyes, etc., and are sufficiently fast. As these dyes are almost completely absorbed by the fibre, there is less reason to fear complaints owing to colored waste water.

By observing the above hints the manufacture of many papers can be made more rational.—British Paper Trade Journal.

Chemical Pulp For Sausage Casing

By W. P. COHOE, E. C. FOX, and A. J. ACTON.

in the Journal of the Canadian Society of Chemical Industry.

Casings for sausage meats at present in use consist of the larger intestines of the ox, sheep, and hog, known in the trade as bungs; the gullet of the ox, known as weasands; and the smaller and middle intestines of the ox. For small sausage the smaller intestines of the sheep and hog are used. They have been used for many generations. No exception can be taken to them provided proper precautions are taken to insure their purity.

In the large packing houses the conditions of purity are more closely watched than in small butcher shops and abattoirs, but a sanitary substitute is highly desirable.

An ideal casing should possess the following properties:

The raw material should be pure and uniform. The process of manufacture should not permit any possibility of contamination by disease germs. The finished product should be of uniform chemical composition. It should be mechanically suitable. It should have a pleasing physical appearance. It should not provide a surface upon which mold and other organisms readily propagate. It should not contain substances injurious to the human organism. It should be, though in many cases not necessarily so, edible. If possible it should be digestible. It should be capable of being kept, stored and transported, under ordinary conditions, for an indefinite period of time, without deterioration.

So great has been the increase in the demand for sausage and bologna, and so drastic of late has been the condemnation of natural casings by Government meat inspectors, that the cost of natural casings is very high and likely to remain so.

There is a certain sized casing for which there is a great demand. Artificial casings can be made in any quantity to this standard at a less cost than the natural casings.

In order to find a substitute for the present casings, a survey of the field of possible raw materials was made, and it was finally decided to try cellulose (hydrate) and to use the viscose reaction of Cross and Bevan.

Bleached sulphite woodpulp is used as the raw material. This is mercerized by the action of caustic soda solution, washed and treated by carbon disulphide.

On the addition of water swelling takes place, giving a thick viscous solution without a trace of fibrous structure. This material is then manufactured into tubes, and passed into a salt solution, which converts it into a yellow jelly. The by-products of the reaction are largely removed by washing in mixed solutions of sodium sulphides and bisulphites. Many of the salts may be removed by heat, either by the direct action of steam, or by passing the tube through a hot solution, either of salts, alcohol, glycerine and many other substances.

The tube, which now consists of cellulose (hydrate) together with adhering sodium salts, is washed thoroughly in boiling water. The length of time necessary to accomplish this may be first determined by an ash determination. When the amount of ash falls to an

amount equal to that in the original bleached sulphite pulp, freedom from impurities is assured. The tube is finally dried, conditioned, and rolled up ready for shipment.

Should colorless product be desired, the tube may be bleached after the hot wash. In this case it is led first through a hypochlorite solution, then washed in water, then led through this sulphate solution and finally washed in water.

At the present time containers of two sizes are being made, large sizes to replace beef bungs for the beef bologna trade and medium sizes in place of weasands for the ham bologna trade.

As soon as the necessary technical data can be obtained, it is proposed to prepare a small-sized casing corresponding to the sheep or hog casings.

Bleached sulphite pulp is pure, abundant and uniform. The chemical treatment it undergoes insures an aseptic condition. In cellulose (hydrate) we have a definite chemical compound, carrying with it slightly varying proportions of water. Inorganic impurities are limited to the small proportion of ash, 0.53 per cent mainly consisting of alkalis and alkaline earths. The finished product contains less ash than the original woodpulp.

As the weight of a sausage casing of cellulose (hydrate) averages 1.04 to 1.12 per cent of the meat, it may be seen that the ash present is insignificant. Still it is in the interests of careful manufacture to set a standard for this.

The experience in Canada with the use of the new product showed that its mechanical properties were satisfactory. Though the origin of the casing was known to the store managers, yet the man behind the counter, who had been handling sausages for years, did not recognize the change of material.

Cellulose (hydrate) casings are transparent and colorless in thin films when unbleached, and when bleached are colorless in all usual thickness. The surface is smooth and glossy, and does not easily afford a lodging place for mold or bacteria. Even supposing they do lodge there such a surface does not furnish food for their growth. This is quite the opposite of the conditions characteristic of the casing hitherto in use. In the case of our product, we have something in the nature of a preservative coating or container. This is particularly true in the case of cooked sausages, where the casing dries rapidly.

Our product when finished contains cellulose (hydrate), moisture, glycerin and ash. The human organism is quite accustomed to cellulose in its varying forms in the ordinary diet. For instance, white cabbage contains 63.25 per cent of cellulose (Hoesslin; Z. Biol. 54,395).

For purposes of comparison it is interesting to note the proportions of fiber carried by various cereal products in common use.

Product	Fiber.	Ash.	Authority.
Wheat flour (finest)	0.3	0.5	Konig
Wheat flour (American) . . .	0.3	0.6	Johnson
Oat meal (American)	0.9	2.0	Johnson
Maize meal (American)	2.0	1.5	Johnson
Whole wheat flour	1.6	1.9	Richardson

There is a lack of uniformity between the results given by various authorities, due undoubtedly to the method used by the older investigators in determining "crude fiber." This error is very large. As much as 39 per cent of the weight of sawdust can be hydrolized

by 1 per cent hydrochloric acid under certain conditions. (See also Krauch and Becko, *Laudw., Vers. Stat.*, 27, 5; Cross and Bevan, *Jour. Soc. Chem. Ind.*, 1903, pp. 165 et seq.) Variations of method probably account for such results as are shown herewith.

Average Composition of Flour of Cereals

Cereal	Cellulose	Ash
Oldwheat	8.3	1.6
Barley	11.5	2.8
Oats	1.0	2.2
Rye	6.4	1.8
Maize	14.9	1.6
Rice	0.2	0.9

Taking the mean content of 1.8 per cent of cellulose in American wheat, obtained by Richardson, after 407 analysis (*Am. 6, 302*), and remembering that the casing of a sausage is from 1.04 to 1.12 per cent of its total weight, it will be seen that the eating of many of the prepared breakfast foods made from whole wheat, e.g., shredded wheat biscuit, involves a larger percentage of cellulose than does the eating of a sausage with cellulose (hydrate) casing).

Furthermore, it can be shown that cellulose (hydrate) is in a form more susceptible of chemical attack than is the hard covering of the cereal grains. To confirm this last point, bleached sulphite woodpulp and cellulose (hydrate) casing were treated side by side

at 100 degrees C. with first 0.50 per cent hydroxide acid, and secondly with 0.50 per cent sodium hydroxide solution. The results were as follows.

	Pulp	Casing
Dry weight	1.7678	1.6258
Weight after 5h. acid treatment . .	1.6468	1.3848
Weight after 4h. alkali treatment . .	1.2278	0.8114
Percentage dissolved in acid . .	6.74	14.82
Percentage dissolved in alkali . .	23.80	35.27

Total percentage dissolved . . 30.54 50.09

Thus cellulose (hydrate) is more easily attacked than normal cellulose and cannot be looked upon as harmful. The ash content of our product, 0.53 per cent, is so small that it may be neglected.

Edibility is demanded only in the case of small sausages, the casings of which consist of intestines of the sheep or hog. The casings of sausages of the bologna variety cannot be masticated in any reasonable length of time, and are simply coverings or food containers. The meat of the sausage also does not adhere to the casing when made of our product, as it does to the old ones. A bologna casing made of cellulose (hydrate) can, however, be masticated. In such a case a soft non-irritant mass is produced. In the case of the smaller sausages, the thickness of the casing is very small (0.204 to 0.006 in.).

RESEARCHES ON ROSIN SIZE

By PROF. MARCUSSON.

(Translation from "Teknisk Tidskrift" made specially for Pulp & Paper Magazine by C. E. Bandelin.)

By "rosin size" is usually understood a mixture of rosin-alkali-soap and free rosin, which is extensively used for sizing paper, and which is obtained by boiling colophony with a solution of soda and sodium hydrate. The purpose of the sizing is to make the paper impermeable to the liquor used for writing or printing (ink, India ink or colors), and to give the paper greater strength and better appearance.

For sizing, the size is dissolved in sufficient water to render the total amount of rosin about 20-50 grams per liter. The more or less milky liquor is then added to the paper pulp in the beater. The finely distributed rosin size is treated with a solution of alum or sulphate of aluminum, when a salt of aluminum, insoluble in water is precipitated, which together with the free rosin also precipitated envelops the paper fibres and gives the paper its impermeability to ink.

A test of rosin size of normal composition may be done either by gravimetric or volumetric methods.

The following method is recommended by Dalen:—2-3 grams of rosin size are dissolved in about 25 cub. cm. of hot water. The solution is washed into a separating funnel of about 300 cub. cm. and 50 cub.

1
cm. of — n H₂SO₄ are added. The rosin separates out
10

and is shaken up with ether. The ether solution is washed twice with water, and the wash water is poured into the water solution previously obtained. The water solution is once more shaken up with ether, after which the sulphuric acid not consumed is titrated

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back with — n. NaOH. If n cub. cm. of NaOH have
10

been used so have (50—n) cub. cm. of acid been consumed to neutralize the alkali in the rosin soap. The composition of the soap is then: Alkali as Na₂O = (50—n) 0.0031 gr. Combined rosin acids (molec. weight = 302), calculated as hydrates = (50—n) 0.0302. Combined rosin acids, calculated as anhydrides = (50—n) 0.0293.

For determination of free rosin acid and unsaponifiable rosin both the ether solutions are united and

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titrated with — n solution of potassium hydrate in
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alcohol in presence of phenolphthalein. If m. cub. cm. are consumed so are rosin acids and unsaponifiable rosin (total rosin) = m0.034, rosin acids = m0.0302, unsaponifiable rosin = m(0.034—0.0302) = m0.0038, free rosin acids 0.0302 (M+n—50).

The following is a common schema for the composition according to analysis:

Alkali (calculated as Na ₂ O)	%
Rosin, combined (as anhydride)	%
Rosin, free (acids+unsaponifiable)	%
Water and impurities (balance)	%
	100.0%

The percentage of water can, besides, be determined by the xylol method directly.

The testing method, according to Dalen, may be used for analyzing rosin size of normal composition. Special methods, however, are required for sizes, now frequently occurring in the market, which may contain animal glue, vegetable glue, casein, albumen, starch, dextrine, gummi arabicum, viscose, etc. The analysis may be executed in the following manner when these substances are present:

The solubility of the size in alcohol is first tested. Rosin size of normal composition is dissolved already at usual temperature. The additional substances mentioned above are insoluble in alcohol and can therefore easily be separated off and determined quantitatively. The substances insoluble in alcohol are tested for percentage of ash, to find out if such materials as clay, heavy spar, etc., have been used as adulterants. A test for nitrogen is made if no ash is found. Two cases may then occur:

1.—The substances, insoluble in alcohol, are free from nitrogen. Glue, albumen and casein can in this case not be present, but starch, dextrin, gummi arabicum and viscose.

In most cases it is starch, that has to be taken in consideration. This substance is recognized microscopically from its characteristic form and from the blue color caused by iodine solution. Starch can be distinguished from dextrin and gummi arabicum on account of being only with difficulty soluble in cold water. Dextrin and gummi arabicum are distinguished on account of the behaviour with acetate of lead solution. Gummi arabicum is precipitated, while dextrin remains in solution.

Viscose (alkali-cellulose-xanthogenate), is dissociated by treatment with diluted mineralic acid; sulphide of hydrogen is formed and cellulose hydrate is separated out.

2.—The substances, insoluble in alcohol contain nitrogen. In this case the substances are first tested for animal glue. Vegetable glue, albumen or casein occur only seldom. Animal glue is completely soluble in water; the solution is precipitated by acetic acid. The percentage of nitrogen in animal glue is about 18 per cent; the percentage of sulphur is low (0.2—0.25%). Animal glue forms with tannin a double combination, with difficulty soluble in water.

Albumen is soluble in cold water like animal glue, but is precipitated when heated.

Casein is insoluble in water as such, but is soluble in combination with an alkali. These alkali combinations are dissociated by acetic acid and albuminous substances, free from alkali, separate out. Casein is distinguished from other albuminous substances on account of its percentage of phosphor (about 0.8%).

Substances, free from nitrogen such as starch, dextrine, and gummi arabicum, can of course also be present if nitrogenous substances have been found in rosin size. Of these the starch is easily recognized by the iodine reaction. For dextrin and gummi arabicum the nitrogenous substances must first be precipitated with an excess of tannin solution. The precipitate is filtered off, the filtrate is evaporated to dryness, and again dissolved in a few cub. cms. of water. An excess of alcohol is added to the water solution. The tannin excess is dissolved in the alcohol, while dextrin and gummi arabicum are precipitated, and determined with acetate of lead, as mentioned above. If no precipitate occurs but only a weak milkiness, when alcohol is added, it may be concluded that dextrin and gummi arabicum are not present.

After the substances insoluble in alcohol have been separated out from a rosin size and tested as described above, there remains only the determination of substances soluble in alcohol, which as a rule consist only of rosin and sodium resinate. This determination is executed in the usual manner.

DUPLEX PAPERS.

In spite of the many known processes the coloring of paper on the paper machine is an operation which has not been largely adopted as it cannot always be combined with the production on a large scale generally required at the present day. Generally the reason of all the difficulties is that the color applied on one side goes through. This defect is obviated by the ingenious patent of H. Gossler, according to which the color is applied to the paper shortly before it runs on to the large drying cylinder for being glazed on one side. The steam produced in the paper drives the particles of coloring matter away from the uncolored side to the outside of the paper web, so that the web appears uniformly colored. It is rarely that the color goes through the paper. The Gossler's process applies too much color to the paper and renders the drying operation difficult. An addition of spirit to the color helps somewhat, but is expensive. A roller which runs directly in the color and against which the paper web is pressed by means of a rubber roll works better. The rolls must either run in ball bearings or be driven. The colored side of the paper which is still wet may not contact with a paper-carrying roll or with the surface of the drying cylinder, because daubing will otherwise occur. As moistening of such papers with water is not possible because the color would be printed on to the uncolored side when rolling up the paper web, steam is used for moistening either on the machine by means of an apparatus in which the steam is brought into contact with the uncolored side of the paper by means of a box like a suction frame, or on the calender. It is not easy to color this paper exactly according to a pattern because the tone of the uncolored web may impair the tint.

PROGRESS AT BELGO PLANT.

The construction of the new 50 ton sulphite plant of the Belgo-Canadian Company at Shawinigan Falls is going ahead favorably, and will be completed in about fifteen days' time.

The rest of the mill is running to full capacity, and turning out from 100 to 165 tons of groundwood and 125 tons of paper per day.

WOOD IS CONTRABAND, SAYS GERMAN DECREE

Copenhagen, November 25, via London.—The Imperial German Government has made it known that all wood will be considered as contraband.

Private advices from Stockholm say that the greatest excitement prevails there as a result of this ruling. A number of ships loaded with timber to a total value of 30,000,000 kroner are lying in Swedish ports ready to put to sea.

The Swedish foreign office lodged a protest with Berlin.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The mill now under construction to replace the Riverside pulp mill at Skowhegan, Me., that was burned during the summer will probably be equipped and ready for business about July, 1915. Considerable new machinery will be added, it is expected, but the building will be about the same size and along the same lines as the old one.

* * *

After several weeks, the St. Regis Paper Company of Northern New York which has been running without a nominal general manager, selected L. B. Stewart of Munising, Mich., who for seven years has been connected with the Munising Paper Company. Mr. Stewart will take over the management of the St. Regis Company at once, assuming charge of the several mills. It is claimed that he is one of the most capable and efficient paper manufacturers in the business. He will succeed David M. Anderson, who several weeks ago severed his connection with the company entirely, disposing of his stock to G. W. P. Gould of Lyons Falls, and throwing the control to him. Since that time Mr. Gould has been managing the company.

* * *

Bonds of the Battle Island Paper Company of Fulton, N.Y., to the amount of \$45,000 held by the City Bank of Syracuse as collateral on loans, were reduced to ownership last week when at public sale the bank bought the securities for \$11,250 (25 cents on the dollar). This was in accordance with the recent order of Judge George W. Ray of the United States District Court.

* * *

Frank L. Moore, of Watertown, N.Y., president of the American Paper and Pulp Association, has recently had three honors conferred upon him. He was re-elected president of the Empire State Forest Products Association, delegate to the third annual meeting of the National Association of Conservation Commissioners held in New Orleans two weeks ago, and delegate of the New York State Waterways Commission at the eleventh annual convention of the National Rivers and Harbors Congress to be held in Washington, D.C., December 9, 10 and 11.

* * *

In discussing the china clay situation, a leading New York dealer this week said to your correspondent that the trade is operating freely in this market, and sales are of satisfactory proportions. Foreign material is commanding \$16 to \$18 a ton, and domestic \$8 to \$9 a ton, according to quality. Imports of china clay in September amounted to 23,640 tons, valued at \$169,192 against 4,416 tons, valued at \$32,273 in September of last year. Imports for the nine months ending September were as follows:—

	Tons.	Value.
1914	212,264	\$1,396,480
1913	183,832	1,243,030
1912	194,382	1,269,301

* * *

The annual meeting of the Association of Dealers in Paper Mill Supplies of New York was held on Wednesday evening, November 11, and all officers were re-elected. Adolph Salomon of 140 Nassau Street, will

serve as President for another term, and Frank C. Overton, of Castle, Gottheil & Overton, continues on his second term as vice-president. The secretary, Fred H. Chase, of Chase & Norton, and treasurer Daniel M. Hicks, continue in the capacities which they have filled since the organization of the association. In the election of the executive committee there was one change in the personnel of the body that ruled last year. Andrew Ragone, of the Main Paper Stock Company, was elected to the committee to succeed P. McNeel, of William Hughes and Co. The other members of the committee are Robert B. Atterbury, of Atterbury Brothers, James Pirnie, of Edwin Butterworth & Co., Edward Smith of Thomas Smith & Sons, Inc., and Louis Darnstadt of Darnstadt, Scott & Courtney.

* * *

The steamer Oregonian arrived at Poughkeepsie, N. Y., last week, with a large cargo of Douglas fir from Seattle, Wash., via the Panama Canal. It was the first of a line of lumber carriers and was an event not without significance. According to good authority, this Douglas fir can be shipped to New York from Washington via the canal, to sell at about \$20 a thousand, and is lumber that competes directly with Maine spruce, which cannot be produced for lumbering uses at that price, let alone to sell at a profit. This may be one of the reasons why the spruce cut in the Maine woods for lumber is to be one of the smallest in years, and it is an indication that spruce is destined to be used more and more for pulp and less for lumber in the State of Maine.

* * *

John G. Luke president of the West Virginia Pulp and Paper Company of 200 Fifth Avenue, New York, has purchased the Millett estate at Irvington, N.Y., which is valued at about \$300,000.

* * *

Richard Gray of 534 Franklin Street, Watertown, N.Y., the regular erecting man of the Bagley and Sewall Company, employed by that concern to travel, wherever needed and erect paper machinery, sailed last week from New York on the S.S. St. Paul for Paris, to France to put up some machinery for the Papeterie de la Seine. He will remain there for about two months putting up machinery for the Watertown Company. Mr. Gray has travelled all over this country for the Bagley and Sewall Company and supervised the setting up of machines. He had planned to go to Paris several months ago, before the outbreak of the war, which made it necessary to postpone his trip, which it is now expected that he can make with safety.

* * *

The Northern New York paper makers who have responded to the call of French manufacturers for help, necessitated because of the war, which drew many of the French paper makers to the front, will not leave until some time this week. The request was made by the French concerns through Stuart D. Lansing, the secretary of the Bagley & Sewall Company, and immediately in the neighborhood of 100 volunteered. But eight, however, will go at the present time.

In a decision arising under the new tariff law the Board of General Appraisers has over-ruled the protest of the Dennison Manufacturing Company and others on the assessment of duty on tissue paper under paragraph 323 at 30 per cent ad. valorem. The importers claimed classification as wrapping paper not specially provided for under paragraph 328 at 24 per cent. It appeared that the tissue paper is known as "grass bleached tissue" and sold as a wrapping paper to manufacturers of gold or silver ware. It was shown that the chief use is for wrapping purposes. Judge Fisher conceded that the paper is a wrapping paper, but decided that it belongs to a distinctive classification as "wrapping paper" known in trade as "tissue paper." He held that Congress intended to make special provision for all tissue papers without exception and that the provision for wrapping paper, paragraph 328, is confined to wrapping papers as are not specially provided for.

* * *

The last load of pulpwood to be brought down Lake Michigan until navigation opens next spring, has just been landed at Michigan City, Mich., for the French Paper Company of Niles. The pulpwood was loaded at Richards Landing, Ontario, and it was shipped by rail from Michigan City to Niles. The French Paper Company gets all of its pulpwood by the lake route, and it has a sufficient amount on hand to last it until the lake season opens next spring. The barge, O. E. Parks, which brought the load down, has for years been used by the paper company to secure its pulp supply and fortunately it has never been hit by one of the severe storms which sweep the lake at this time of the year.

THE PULP SITUATION IN SCANDINAVIA.

(Special to Pulp and Paper Magazine.)

New York, Nev. 25, 1914.

H. B. Steffanson, who is widely known in the United States and Canadian pulp industries, returned several weeks ago from Sweden, where he had been for about six months. Though he was in the army drilling recruits part of the time, he studied the pulp situation in Scandinavia very carefully, and secured his leave of absence to return to this country. Mr. Steffanson has been manager of the pulp department of Charles F. Hubbs & Company, Lafayette and Fourth Streets, this city, but he has severed that connection and this week branched out for himself, under the firm name of Steffanson & Co. He has made connections with several Scandinavian mills and has a good quantity of pulp on the way. He is located at 30 E. 42nd St., New York.

In discussing the Scandinavian pulp situation brought about by the war, Mr. Steffanson says:—

"The war has changed the paper and pulp markets of all the world," he said. "In Scandinavia two weeks after the war broke out nobody engaged in manufacturing or shipping thought it would be possible to make further shipment pending hostilities, and for that reason and also to the scarcity of labor account of the mobilization of the armies in both Sweden and Norway and a number of pulp and paper mills were closed. Later, however, when the situation could be viewed more clearly, and thanks to the clear-sightedness of European Governments, trade was resumed wherever possible. The Government, for instance, insured reasonable rates not only on vessels but on cargoes of European countries. At the outbreak of

the war strong sulphite advanced from 130 to 165 kroners F. O. B. Scandinavian ports, England being the principal buyer. Great Britain had also to supply France with paper for their newspapers and periodicals. Easy bleaching sulphite went as high as 180 to 200 kroners F. O. B., and considerable quantities were placed at these figures for immediate shipment. Hardly any kraft pulp was available outside of contracts already placed, and such lots as were sold for immediate shipment commanded about 160 to 165 kroners F. O. B. net cash.

"It must be remembered that Finland, for years the principal supplier of sulphate pulp, is not in a position to ship at present. The principal ports of that country, such as Wiborg, Hango, and Kotka, have been closed to navigation by the Russian authorities. The small quantities that have been shipped since the war began, in all not more than a few hundred tons, have been sent via Raumo, but this port is so overloaded with more necessary goods that they do not care to handle an article like wood pulp on a large scale. In fact, they would block Russian commerce completely via Finland and Sweden, if they attempted to do so, and besides this the extra cost involved for pulp transportation has risen about \$5.00 per ton. By reason of these obstacles most of the Finnish sulphate mills have been closed, and so are many other industries, with the exception of those supplying Russia.

"German mills are more or less dependent on Russian wood and so long as hostilities last they will be unable to get further supplies. With what they have now on hand they can, of course, keep their mills in operation, but in 1916 they will probably have to close for lack of raw material.

"Sweden and Norway have found it very difficult to keep going. Coal soared in price and was difficult to secure. Sulphur was at a premium, money was scarce and shipping difficult, and to cap the climax, the country suffered from unusual drought. Not in a generation have the rivers been so low as they are now. Those mills which can afford to do so are putting in steam power so as to be independent during the winter, and it is feared that cold weather following this severe drought will add considerably to the difficulties of the situation. With a higher cost for everything, the pulp mills are entitled to higher prices than those prevailing before the war, and manufacturers take a correspondingly rosy view of the situation. With a higher cost for everything, the pulp mills are entitled to higher prices than those prevailing before the war, and manufacturers take a correspondingly rosy view of the situation from a seller's standpoint. Hardly any stock for this year remains unsold and goods placed previously in France find a ready market elsewhere at advanced prices. France, however, has begun to take delivery again; a steamer from Sundsvall left for Rouen loaded with sulphite pulp in October.

"The Baltic will soon be closed to navigation and the manufacturers are not inclined to sell now for next season except at their own terms.

"There are no stocks anywhere of kraft pulp. Easy bleaching sulphate is so scarce that English buyers have had to content themselves with ordinary strong sulphate in some instances. Finland's products of over a hundred thousand tons of sulphate being cut off, it means that kraft is in a better position than anything else and a considerable advance is to be expected later on."



BRITISH TRADE NEWS



□ SPECIAL TO PULP & PAPER MAGAZINE □

London, November 16.

An event of great importance in the British paper-making industry was the autumn general meeting on November 5th of the Papermakers' Association of Great Britain and Ireland, Mr. Joseph Dixon presiding in the absence of the President owing to official duties. There were also present Sir John Thomas, Messrs. John Dobson, H. W. T. Garnett, Howard Peebles, J. C. Hutchieson, Wm. N. Bates, Chas. King Smith, J. R. Alexander, J. E. Jepson, Cuthbert Dixon, C. Barton Smith, T. D. M. Burnside, Herbert Green, J. G. Entwisle, R. Gilroy, A. E. Reed, T. Parker Smith, John Charnock, A. de Burgh Wilmot, W. W. de Buriatte, D. Clegg, A. Saword, W. A. Kershaw.

The question of railway rates and demurrage was first taken up, resulting in a recommendation to lay an application before the local Chambers of Commerce.

The energetic Secretary, Mr. Alfred W. Foster, read his report, showing that the recently-instituted plan of securing co-operation among the papermakers to the end of getting low rates with the British Dominions' General Insurance Company, was being received with great favor.

On the question of terms of credit for wood pulp and paper, Mr. Gilroy said the Northern Committee had been in consultation on the question of the cash payment of wood pulp before shipment, and they considered it one that the Association ought to deal with rather quickly. Demands had been made for cash payments before the stuff was actually shipped, which was quite contrary to any of the contracts in question. The Northern members felt that if these demands continued to be pressed, the situation might become rather aggravated, and in that connection it was suggested that their Association should approach the Wood Pulp Association on the matter, so that the normal terms of payment should be made and come into effect quickly. It was true that in many cases the mills had been rather short of supplies, but he believed to-day the difficulties had been pretty well got over. They were given to understand that after the moratorium had expired the normal condition of things might be expected. In some cases at least that was not so; they had received information that there were sellers of pulp to-day who were demanding and exacting cash payment before deliveries were effected. It was a subject that ought to receive some consideration at that meeting, and if it was at all possible normal terms of payment should be reverted to as early as possible.

The opinion was expressed by the Chairman and others that the trouble alluded to would be found to be largely over.

The chairman thought that there ought to be a custom that instead of handing out the whole of the money, they ought to hand out 90 or 95 per cent of the money. They had done this in many case, unless they had the personal guarantee of the agent and he became personally responsible. If members of the Association adopted that policy, of only paying or accepting 95 per cent of the goods and leaving a balance over until the contents of the parcel had been ascer-

tained, they would be carrying out their business in a better way than by trusting to bring an action against the foreigner—or whoever he might be, but mostly a foreigner—for a reduction for any arrears in his invoice. He threw this out as a suggestion to members; it was a policy they were adopting whenever they possibly could.

The Chairman said they all agreed with Mr. Gilroy, that if they could get all their customers to pay every two or three months it would be of very great assistance to them in the conduct of their business. But he did not think it was possible for them to interfere with regard to the terms of credit generally. If they sold to their customer at a low price, depending on him for cash payment, and if the following month he did not pay, then it was for them to press him to fulfill his engagements. But he did not think it was possible for them to adopt a hard-and-fast rule with regard to terms of payment from their customers.

In the matter of esparto supplies, the Secretary explained that there had been some difficulty in the collection of the Oran esparto crop, owing to some dispute as to the manner of the French Government's payment of the native labor. The matter had been taken up by the Association, and representation had been made to the Foreign Office and other Government departments. The last information he had was that the situation had perceptibly eased, and possibly the esparto crop would be saved. With regard to the exportation of rags, a letter had been received from the Board of Trade stating that they were not prepared to issue an order prohibiting the exportation of rags for papermaking. That did not put an end to their desire and activities in this direction. Intimation had been received that the matter of the exportation of rags was to be brought before a Cabinet Committee, and an effort made to prevent British rags being bought up and exported.

A motion followed, to the effect that measures be taken to prevent the exportation of rags and raw fibres from this country, but not applying to waste paper.

The discussion on the difficulty into which the industry had been thrown as a result of the cutting off of dye supplies from Germany, terminated in a motion: "That the attention of the Government be called to the importation of foreign papers dyed with German dyes, to great prejudice of British manufacturers of paper, who are prohibited from obtaining these dyes."

When the business meeting was over the members of the Association sat down to dinner in the evening, and owing to the informal way the proceedings were arranged a very happy and pleasant time was spent. The event also afforded the members an opportunity of discussing matters appertaining to paper manufacture and trade conditions in a private and helpful manner, whilst those who were disposed to talk business enlivened things by their opinions on our tariff policy and the subsequent effects predicted of the great European war which we are now passing through.

Toasts to the King, and the President, were honored, and after a gay hour in witty speeches, a most successful meeting came to a close.

(Brief of report by "World's Paper Trade Review.")

NEW PATENTS

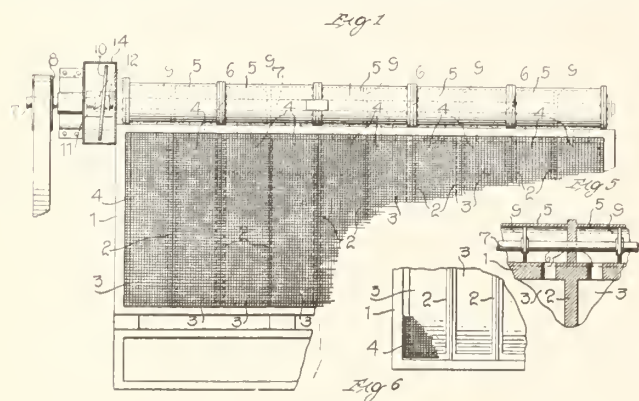
PAPER AND PULP SCREEN.

Zenford Terrian and James Lennon, Jr., of Fort Edward, New York, Patentees.

Patented in United States Patent Office, Oct. 27, 1914.

The inventors say: This invention relates to certain improvements in paper and pulp screens and has relation more particularly to a device of this general character wherein suction is employed to draw the pulp through the screen plates; and the object of the invention is to provide a device of this general character having novel and improved means for creating the requisite suction action and wherein such means is positioned to one side of the plates.

The invention consists in the details of construction and in the combination and arrangement of the



several parts of our improved device whereby certain important advantages are attained and the device is rendered simpler, less expensive and otherwise more convenient and advantageous for use, all as will be hereinafter more fully set forth.

The novel features of the invention will be carefully set forth in the appended claims.

In order that our invention may be the better understood, we will now proceed to describe the same with reference to the accompanying drawings, wherein—

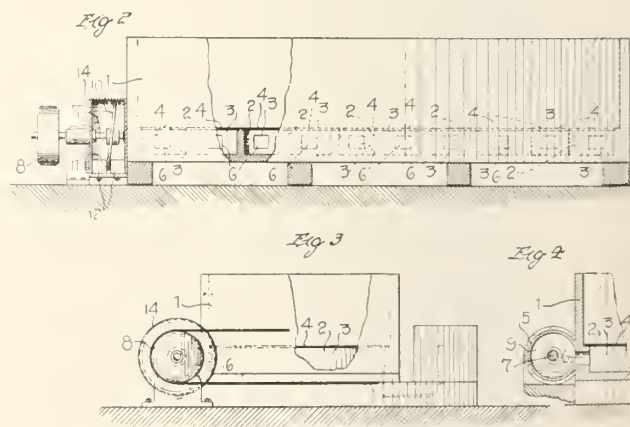
Figure 1 is a view in top plan with parts in section of a screen constructed in accordance with an embodiment of our invention. Fig. 2 is a view in front elevation with parts in section of the device as embodied in Fig. 1. Fig. 3 is a view in end elevation of the device as herein disclosed. Fig. 4 is a fragmentary sectional view taken through one of the cylinders herein disclosed and its concomitant parts. Fig. 5 is a horizontal sectional view taken through adjacent cylinders, as herein disclosed. Fig. 6 is a fragmentary view in elevation illustrating in detail the screen plates herein disclosed.

As disclosed in the accompanying drawings, 1 denotes a suitably supported vat provided with a plurality of partitions 2 whereby the chambers 3 are afforded, such partitions being of predetermined height, and the chambers thus created are inclosed, in any suitable manner, by the screen plates 4. Suitably supported adjacent one side of the vat 1 are the cylinders 5, herein shown as disposed in substantial continuity,

each of such cylinders being of such a length as to intersect the ends of two adjacent compartments 3 and being in communication with such compartments, as indicated at 6. Extending through each of the cylinders 5 is the common rod 7 adapted for sliding or reciprocal movement therethrough and having one end projected beyond an outermost cylinder 5 whereby a suitable operating means may be affixed, such means being herein shown as a belt or band wheel 8 adapted to be coupled, in the usual manner, with any source of supply. Fixed to the rod 7 within each of the cylinders 5 and at a point intermediate the communicating ports 6 is a disk 9 which upon recurrent or reciprocal movement being imparted to the rod 7 is adapted to result in the requisite suction action within the adjacent chambers 3, for purposes which are believed to be clearly apparent to those skilled in the art to which our present invention appertains.

In order to impart the requisite reciprocation or recurrent endwise movement to the rod 7, we herein disclose affixed to the projected portion of such rod the cam disk 10 adapted to travel through the guideway 11 afforded by the spaced blocks 12, such blocks being herein shown as suitably affixed to the annular band 14 suitably secured to the adjacent end of the vat 1. By this arrangement, it will be observed that as the rod 7 is rotated, the formation of the cam disk 10 is such as to result in reciprocation of the rod and it is thought to be obvious that the extent of reciprocation of the rod can be regulated by varying the pitch of the cam disk.

From the foregoing description, it will be obvious that a paper and pulp screen constructed in accordance with our invention is of an extremely simple and comparatively inexpensive nature and is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and of the



effectiveness with which it performs its requisite functions and it will also be obvious that our invention is susceptible of some change and modification without material departure from the principles and spirit thereof and for this reason we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice.

Having thus fully described our invention what we desire to claim and secure by Letters Patent, is:—

1.—The combination with a vat provided with a plurality of chambers, and screen plates for covering such chambers; of a cylinder common to adjacent chambers and in communication therewith through suitable ports produced in the adjacent wall of the vat, a rod capable of endwise reciprocal movement within such cylinder, a disk within the cylinder fixed to such rod at a point intermediate the points of communication between the cylinder and the adjacent chambers, and means for imparting reciprocal movement to the rod.

2.—The combination with a vat provided with a plurality of chambers, and screen plates for covering such chambers, such chambers being arranged in a series of chambers and in communication therewith through suitable ports produced in the adjacent wall of the vat, a rod common to all the cylinders and directed therethrough and capable of reciprocal movement, a disk fixed to such rod within each of the cylinders intermediate the points of communication of such cylinder with the adjacent series of chambers, and means for imparting reciprocal movement to the rod.

PROCESS FOR THE RECOVERY OF PULP FROM WASTE PAPERS.

John M. Burby, of Astoria, New York, Patentee, Assignor to the Pembee Company, of New York.

Patented in United States Patent Office, Oct. 6, 1914.

The inventor says: In the processes for the recovery of pulp from printed waste papers, described in the literature and Letters Patent relating to the art, solvents are employed to dissolve or saponify the oily constituents of the printers' ink, and in some of them directions are given to boil such waste papers in the stated solvents, or to subject them to the action of such solvents heated by steam under pressure, to reduce or destroy the adhesivity of the ink, sizing, etc., to facilitate the separating of the pulp fibres therefrom. The grades of paper, known collectively as print or "news print papers" and some grades of "book papers" are made partly—some of them largely—of wood fibres, produced by grinding of raw wood. This material, known as the "mechanical wood pulp," differs from the "chemical" or "sulphite" pulp in that the fibers of this "mechanical" pulp, not having been subjected to the chemical process—digesting—retain the nature of raw wood. When waste papers, made partly of this "mechanical" wood pulp, are subjected to the action of such, or as strong solvents as are to be used in the processes heretofore known, or of such solvents heated, or under steam pressure, the raw wood fibers are discolored. This discoloration is very similar to that produced by exposing such papers to strong sunlight and cannot be obliterated, because the fibers of mechanical wood pulp are detrimentally affected by bleaching, and liable to be rendered thereby wholly unfit to be used again, except probably as a filler. The more concentrated, or the hotter the solvent is employed, the more intensive is its discoloring effect, and the larger the proportion of the mechanical wood pulp is contained in the waste papers, the more pronounced is the discoloring effect upon all the pulp recovered. The fibers of the so-called "chemical" pulp are not so discolored by these solvents, or by subjecting them to the action of such solvents in highly heated state, but as it is not practically feasible, to separate the fibers

of this "chemical" pulp from those of the "mechanical" pulp, the processes, heretofore known, cannot be employed for the recovery of pulp from waste papers containing a percentage of the mechanical wood pulp, wood pulp, without their being discolored or their suited to such an extent that it is no longer suitable for the manufacture of the same grade of paper for which it was originally used.

The object of this invention is to devise a process to recover also the fibers of this so-called mechanical because the pulp thus recovered is reduced in quality ability for use in the manufacture of the same grade of paper otherwise impaired.

Alkalis are most suitable for use as solvents in processes for the recovery of pulp from printed waste papers, but if used in solutions containing more than the equivalent of two parts of caustic soda to one thousand parts of water, or if weaker solutions are employed at a temperature of about 150 deg. F., or more, they produce the explained discoloring effect upon the mechanical wood pulp which may be contained in such waste papers. I found, by an extended course of experiments, that a solution of one, or even less than one, part of caustic soda, measured by weight, in one thousand parts of water, if employed in proportionate quantities, is, in most instances, sufficient to so diminish the adhesivity of the oily medium of printers' ink, and of the sizing, that the pulp fibers can be readily separated therefrom, and that a solution containing less than two parts of caustic soda, or its equivalent of other alkali, does not discolor the fibers of this mechanical pulp, unless heated to more than 150 deg. F. Heating increases the intensity of the action of such a weak solution and causes it to produce, to a degree, the stated discoloring effect upon the fibers of the mechanical wood pulp.

In place of caustic soda, caustic potash may be used, and it should be noted, that one and four-tenths of caustic potash are in these respects equivalent to one part of caustic soda; otherwise all said herein, as to the use and effect of caustic soda, applies equally to caustic potash. Other alkaline solutions or compounds, as for instance, carbonate of soda and of potash, or ammonia, are effective in dissolving or saponifying the oily ingredients of printers' ink and of the sizing, but they also have a similar discoloring effect upon the fibers of the mechanical wood pulp, if used in solutions containing more than the equivalent of two parts of caustic soda to one thousand parts of water, or if a weaker solution of any of these alkalis is used hotter than 150 deg. F. Also ammonia is not as effective in discoloring the fibers of mechanical wood pulp when used diluted proportionately to the stated standard of two parts of caustic soda to one thousand parts of water. It is, however, not as certain in its effect upon the oily adhesive ingredients of printers' ink as the equivalent solutions of caustic potash or soda, or of their carbonates, and if used in a stronger solution, is apt to produce a yet darker brown discoloration of the fibers of the mechanical wood pulp.

The process of recovering pulp from printed waste papers, is best carried on, according to my invention, as follows: The waste papers are pulped in a beating engine and then conveyed to chests, provided with mechanical agitators. There is a quantity of the caustic soda solution is added thereto, so proportioned that, taking in consideration the quantity of water contained in the beaten stock, and which averages about twenty-nine thousand pounds to each ton of such waste papers, there should be not more than two pounds of caustic soda, or its equivalent of some of the other alkalis, to

one thousand pounds of water. It is necessary to explain, that in the course of the process, a part of the alkali, contained in the solution, is consumed in saponifying the oily and adhesive ingredients of the ink and sizing. Taking, as a standard, a solution, containing one part of caustic soda (or its equivalent of other alkali), to one thousand parts of water, this consumption of the alkali amounts to from thirty-three to forty-one per cent., if a quantity (weight) of the solution, equal to fifteen times the weight of the paper stock treated, is used. The percentage of the consumption will be greater, if the solution is used in a smaller proportion, quantitatively, to the dry weight of the paper material is thoroughly mixed and agitated in the solution and then the liquid is drained off, the pulped stock treated. Consequently, a somewhat stronger or more concentrated solution may be employed at the start of the process, provided that it be used in a sufficient quantity—not less than fifteen times the dry weight of the paper stock—as the strength of the solution is quite rapidly diminished by the consumption of the alkali contained therein. When determining the initial strength of the solution, also the proportionate quantity of water, contained in the pulped material, when it is run out from the beating engine, on the average of about fourteen and a half times its weight, must be taken in consideration as diminishing the strength of the solution added thereto. The pulped material conveyed upon movable screens and there washed with fresh clean water, whereby the carbon or other pigments, and other impurities, are removed, all traces of the alkali eliminated therefrom and the clean pulp fibers recovered. To avoid the difficulty, if there be any, in determining the proportionate quantity of alkali to be used to produce a solution of only the requisite strength, the alkali may be dissolved in the water delivered into the beating engine and the waste papers subjected to the beating process; if this course is followed, the pulped material need not be treated again in the chests, but should be soaked in fresh water and drained, before being conveyed upon the screens. The pulp recovered from waste papers thus treated, may be conveyed to the paper making machine, or stored for future use; the fibers of the mechanical pulp contained therein are then and remain in such physical condition and color that the pulp can be used again as it was recovered, without any further treatment, in the manufacture of new paper of such a grade.

ANNUAL MEETING OF EMPIRE STATE FOREST PRODUCTS ASSOCIATION.

(Special to Pulp and Paper Magazine.)

Utica, N.Y., Nov. 25, 1914.

As briefly reported in the Pulp and Paper Magazine on November 15, the ninth annual meeting of the Empire State Forest Products Association was held here on Thursday of last week. Frank L. Moore was unanimously elected president to succeed himself for the fifth time.

In a brilliant address President Moore dilated upon the interest of every citizen in the State in the preservation of the forests and water-powers. He said in part:—

“Gentlemen, if the time is not here it is almost here, when questionable political methods for gaining public confidence will be a thing of the past. We are living in an intelligent age, among intelligent people, and people who are becoming more intelligent every day, and every year, and they are going to demand above all else a constructive policy for what has been the

foundation of our prosperity, and what will bring prosperity to the generations to come—the conservation of our natural resources.

This is the greatest problem that is before the people of this State to-day. There is much information that is being gathered now by the Conservation Commission in regard to our natural resources, particularly in regard to water storage, but we need to know more about our forests.”

He went on to suggest that a thorough-going inventory of the State forests should be made by the graduates and students in the two institutions of the State having forestry education.

There must be action, according to President Moore: “The State finds millions of dollars for good roads and canals because the people want them. Why should it neglect that which is the foundation of our prosperity, particularly when that department can be made self sustaining from its own broad acres! Where necessary the watershed of our rivers should be reforested, to the end that nature may assist in the more even distribution of the water that flows down our streams.

In order that the greatest amount of moisture may be retained in the soil, every piece of land within the State, not suitable for other purposes, should be reforested. I believe that soon every board of supervisors, assisted by the State, will employ a forester to study the condition of such county and make recommendations for reforesting such portions as are suitable for that purpose. Proper laws must be enacted to carry out a project of this kind. This is just as essential for the continuous prosperity of our agricultural interests as it is to reforest the watersheds of our streams. The moisture strata in the soil must be kept as near the surface as possible, and this can only be done by a proper forest cover.

I often times think our people are slow to see the necessity of making a beginning for conserving and making self-productive our natural resources. We have but to consider the vast barren tracts of land in China, from which the tree covering has been removed, and no attempt made to reforest it, to understand what procrastination means. We have but to consider the beautiful forests of Germany, made self-sustaining through the efforts of an industrious, far-seeing people, whose government is ever ready to lend moral and financial support to its people in the furtherance of all such propositions as make for their general welfare. If this could be brought to our full realization, I believe everyone would demand immediate consideration of the suggestions I have made.”

The report of the Forestry Committee was presented by the chairman, W. L. Sykes. It touched upon fire protection, slash disposal, dangers from careless campers and hunters, and workmen's compensation. The committee heartily commended the proposal to establish a forest products laboratory at Syracuse, and drew to the attention of the legislature the necessity of increased appropriation for forest purposes.

The wise cutting of timber and the proper degree of co-operation between State, public and timber owners, were warmly championed by the committee.

The usual banquet in the evening followed the day's sessions.

The officers of the Association for the forthcoming year will be:

President—Frank L. Moore, Watertown, N.Y.

Vice-president—E. J. Jones, Bradford, Pa.

Secretary and Treasurer—H. J. Cadwell, Carthage, N.Y.

PULP AND PAPER NEWS

According to the returns for the Department of Lands, Forests and Mines, of Ontario for the last fiscal year just closed there has been a falling off in receipts, an amount of \$458,000 less than the estimates having come in. The chief decline has been in the revenue from timber, which was placed at \$2,000,000 and reached only \$1,698,445, a shortage of \$301,555. Lumbering from pulp wood operations were not so much affected as the cutting of railway ties, of which a comparatively small number were taken out.

S. J. Moore, of Toronto, who is president of the Pacific Burt Co., the N. F. Burt Co., the American Sales Book Co., was also President for many years of the Metropolitan Bank, which institution has just been merged with the Bank of Nova Scotia. Mr. Moore has been elected one of the new directors of the latter institution.

Another legal echo has been heard of the Imperial Pulp and Paper Mills of Sturgeon Falls, Ont., which are now part of the system of the Spanish River Pulp and Paper Co. Recently the Appellate Court, Toronto, by the value of 2,175 cords of pulp wood reduced the judgment for \$20,932.45 awarded the Quebec Bank against the Sovereign Bank by Hon. Justice Britton.

It is understood that the Ocean Falls Pulp and Paper Co., of Ocean Falls, B.C., will re-open in all branches at once as a new company known as Pacific Mills, Limited, has been incorporated with a capital of \$9,500,000 to take over the Ocean Falls Co., which has been in financial difficulties for a long time. It is said that the English shareholders, of which I. Hamilton Benn, M.P., is one of the most prominent, have consented to the new deal.

S. B. Gundy, Vice-President and Managing Director of the Kinleith Paper Mills, St. Catharines, and W. J. Gage and Co., Toronto, has returned from an extended business visit to the Coast. The company have officers in Winnipeg and Vancouver. Lieut. C. S. Patterson, who is Secretary of the Kinleith Paper Mills and Paymaster of the 19th Regiment, is among those who have enlisted with the Second Contingent, and is at present at Exhibition Park, Toronto. Mr. Patterson was presented by the staff of the Kinleith Mills with an appreciative address and Colt's revolver as a mark of esteem.

E. P. Lindsay of Boston, sales manager of the Brompton Pulp and Paper Co., of East Angus, Que., whose new newsprint mill will soon be in full operation, turning out about sixty tons per day, from the new Fourdrinier, which is 160 inches wide, was in Toronto and Montreal last week on business. He reports that the company are doing a fine business in kraft paper, which appears to have a splendid demand since the war broke out.

The Daily Courier, which was launched in Toronto about a month ago has ceased publication. It has been merged with the weekly edition of that paper, which has been issued for years, and will be more liberally illustrated than ever with pictures of the war and other events of national importance.

A. F. Cayford, secretary of the Wayagamaek Pulp

and Paper Co., Baptist Island, Que., was in Toronto last week calling upon the trade. He reports that the company are rushed with business, having received a number of heavy orders of late, particularly since German kraft has been shut off.

R. G. Alder, representing the widely known English paper firm of John Dickinson and Co., London, which have offices in Montreal, has arrived in Toronto, where he will open an office and look after the interest of the company, which make writing, ledgers, litho, linen face and other lines.

W. E. Stavert, President of the Spanish River Pulp and Paper Co., is at present in England arranging for a delay in the payment of the interest on the five million dollars, six per cent, first mortgage bonds of the Lake Superior Paper Co., which are largely held in England. It is said that payment of the interest will be deferred one year, and also the commencement of the sinking fund will be delayed. The three hundred thousand dollars, which will be saved for the company by the deferment of the interest, will be used as working capital, and the company will, therefore, not require any new financing. It is expected that the annual report of the Spanish River Pulp and Paper Co. will soon be published. All the plants of the company are busy.

John S. Ferguson of Toronto, who was an inspector of the northern development branch of the Lands, Forests and Mines Department of the Ontario Government, was found dead beside the Timiskaming and Northern Ontario railway tracks about eight miles from North Bay. It is believed that he fell from a train. He was fifty years of age and leaves a wife, one son and one daughter.

Recently considerable excitement was caused in Merritton by the discovery of three sticks of dynamite in a field near the sulphite mills of the Riordon Pulp and Paper Co. The dynamite was capped and fused and may have been for the purpose of wrecking the Welland Canal. An investigation is being held. Extra guards have been placed on the Welland Canal, and an old school at Thorold has been turned into winter quarters for the members of the 44th Regiment, of which about three hundred and fifty men are now doing duty. The Daughters of the 19th Regiment, St. Catharines, recently issued a patriotic number of the St. Catharines Journal, the proceeds being devoted to furnishing comforts to the men on guard along the canal.

A statement has been issued to the shareholders of the Toronto Paper Manufacturing Co., by R. S. Waldie President of the Company, covering the affairs from the beginning of the financial year—April 1st—up to the present. Mr. Waldie says in part:—"After the 15th April, it early became apparent that bad times were to be expected, and in your interest, we decided quarterly dividend of 1½ per cent was paid you on the to discontinue the dividend, and notified you to this effect. Our action in that regard has since proved of great value, as it saved us from the necessity of applying for assistance to our bankers in a time of great

financial stress. Up to the beginning of the war, our operations may be described as satisfactory, in view of the conditions as they existed. The war has upset all that stability which is so necessary and desirable in business. In our own case, it has caused a marked increase in the cost of many of our important raw materials, without a corresponding increase in the price of the finished paper—this latter no doubt owing to the general slackness of orders. When you hear or read of Canadian paper mills being rushed with orders owing to the war, you must understand this to mean only those mills which make newsprint paper. One encouraging feature to be noted at this time is that we find our people are becoming alive to the necessity of using, as much as possible, goods of home manufacture, and we expect you to do your share in this regard by insisting on paper made in Canada. This company makes book and magazine paper, writing and envelope paper, litho and ledger paper; in short, the paper used in everyday affairs. Although we do not supply the printer, except through the wholesale house, yet your inquiry to him will work back to the wholesalers who buy from the mill, and so help us. Needless to say, we are conducting the affairs of this company with the strictest economy, and results for the current year to date are that we have more than earned our fixed charges; we have not borrowed any money; we have kept the mill running; we have not reduced wages, and we have not starved the plant. We, therefore, think the shareholders may regard the company's future with confidence, and our prosperity will be coincident with the prosperity of this whole country.

A charter has been granted to the Port Arthur Daily News, Limited, with headquarters in Port Arthur and a share capital of two hundred thousand dollars. The company is empowered to engage in a general printing and publishing business, and also to manufacture and deal in paper boxes and stationery. Among the incorporators are E. B. MacKay, Wm. A. Anderson and D. McD. Hogarth.

Extensive improvements have been made to the offices of George A. Howell and the Standard Paper Co., 109 George Street, Toronto. W. P. Ryrie, manager director of the Becker Co. of America, Limited, has removed his offices from 28 Wellington Street West to the new Ryrie Building, corner of Yonge and Shuter Streets, Toronto.

The Ontario Government has spent in the development of Northern Ontario during the past fiscal year \$802,578, under the direction of J. F. Whitson, Northern Ontario Commissioner, as a branch of the Ontario Department of Lands, Forests and Mines. It will be remembered that three years ago the Ontario Government made a grant of five million dollars for the improvement of the northern part of the province and already over two million dollars has been expended. The larger part of the outlay has been on road construction in the districts of Nipissing, Timiskaming, Sudbury, Algoma, Port Arthur, Fort William, Fort Frances and Rainy River. A portion of the money spent during the past year was in the construction of fire breaks.

According to an announcement made last week by Hon. W. H. Hearst, Premier of Ontario and Minister of Lands, Forests and Mines, an important step will be taken at the next session of the Ontario Legislature, when legislation will be introduced to give licensees of pulp limits the power to export, where necessary, pulp wood from Crown lands. This step will be made for various reasons, among them being

lack of employment in certain northern parts of the province, the large amount of fallen and burnt timber which would be wasted if not cut soon, etc., but it will be distinctly stipulated that the demands of Ontario mills must be met first before any pulp wood can be exported to the United States. At the last session of the Ontario Government a bill was put through throwing open pulp wood to the American market in order to clear a large amount of fallen timber, and the present move is merely an enlargement of that bill. There is not the slightest intention, however, of the province going back on the legislation passed several years ago prohibiting the export of pulpwood in its raw state across the border and the course adopted is merely a temporary expedient to prevent waste and unemployment. Every safeguard will be taken to see that Ontario plants are first provided with all the wood necessary.

Mr. Heart points out that an example is to be found in and around Port Arthur where there are no mills, but where there is considerable wood. If licensees were compelled to ship the wood to the Soo or the nearest plant they would lose all profit, whereas if they are permitted to ship it across the American border, they will provide work for the unemployed and save the timber at the same time. In the districts where the wastage is about to occur, there is hardly enough wood to warrant any manufacturer or company going to the expense of putting up a ground wood mill which would entail an outlay of several hundred thousand dollars and, before such an enterprise would be carried out a firm would have to have raw material sufficient for twenty or thirty years, which is not the case in the localities where the waste is now facing the province.

Mr. Frank A. Spear, formerly with the Abitibi Pulp and Paper Co., Iroquois Falls, Ont., as millwright, is now with the St. Lawrence Pulp and Lumber Co., at Chandler, Que.

Mr. J. G. Mayo, formerly General Manager of the Southern Paper Co., Moss Point, Miss., has gone with the Bathurst Lumber Company, Limited, Pulp and Paper Division, as office manager.

CELLULOSE DRESSINGS FOR WOUNDS.

Dressings of bleached cellulose for wounds has several advantages over cotton dressings; partly because it is cheaper and partly because it is sterile on account of the method of manufacture.

The consumption has increased and cellulose cotton is used also for other purposes than dressing wounds. It has been approved by the doctors of the Swedish army department, especially as it might be impossible under certain circumstances to import cotton. At present about 75 tons are used in Sweden under normal conditions.

Cellulose cotton was used extensively for dressing wounds in the Russo-Japanese war. It has later been widely used in Russia, and the material has been imported from Germany. This import has now been stopped and Russia has a great need of cellulose cotton, not least for its enormous armies. Common cotton seems to be difficult to obtain there in sufficient quantities.

Russia has, therefore, during the last months sent out many and urgent inquiries for cellulose cotton, or "Lignine."



The Markets

CANADIAN MARKETS

Conditions in the news print situation remain about the same as they have been and are getting more normal all the while. There is a good, firm, healthy tone to the market but the visions entertained by some manufacturers that prices would take a considerable jump at the close of the year when contracts which expire have to be renewed are not likely to materialize. It is learned that a few contracts have already been entered into at the same figure as last year. All the plants are busy and the foreign demand is keeping up well.

Shipments across the border continue to increase according to the returns tabulated and are now running about one million two hundred thousand dollars a month.

In the book and writing lines matters remain about the same and orders are rather spotty. Most of the plants are operating only five days a week but some new business has been developed by Canadian consumers, who have not been able to get supplies of ledger, heavy book, bond and other English lines asking Canadian plants to match these as closely as possible. Water conditions are not any too good and some mills, which are located on the St. Lawrence and other streams and derive their power from this source, have been compelled to shut down one or two days a week owing to low levels. It is expected that this set-back will be overcome, however, as soon as navigation closes at the end of the month or early in December. If plants were really busy, considerable loss would be represented by such shut-downs. Prices have not advanced, although the cost of materials have gone up considerably, and there is not any probability of any change in the situation until the termination of the year when new contracts for sulphite have to be made. It is not thought that sulphite producers will care to enter into any lengthy arrangements with mills until it is definitely known what the effect of foreign importations will be. The possibility of the British Admiralty closing the North Sea has made the price of sulphite more uncertain than ever. Scandinavian mills are reported to be running short of coal and sulphur and the latter, being obtained principally from Sicily, is contraband of war. There has been an easing off in prices, but a leading Canadian importer stated this week that, while consumers might now be able to get foreign supplies in any desired quantities, yet he looked for a scarcity about the first of March which would cause quotations to jump to as high as a point as they were immediately after the outbreak of hostilities. The figure for ground wood pulp is stiffening and there has been during the past few days a steadily increasing demand. Bags and toilet papers are in active requisition and mills turning out papers for papereries and fancy stationery are enjoying a good run owing to the contemplated active trade during the holidays.

The demand for Manila and kraft papers is good and jobbers report a fair general turnover for the past month. They expect that business in their line will fall considerably during the coming month as, after the first week in December, travelers are generally

taken off the road until the Christmas season and the time is employed in stock-taking. Collections are only fair and buying is in limited quantities. There has been a rise of about ten per cent on colored board owing to the scarcity of deep colors. Prices in specialties have also considerably stiffened during the past few weeks. Mixed papers are quiet, and there has been some flurry in hard white and soft white shavings, but in other lines in the rag and paper stock arena, there is nothing of unusual interest to record.

Prices f.o.b. Toronto are:—

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.15 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload) No. 1, \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp (at mill), \$17.00 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$47, delivered in Canada.
 Sulphite (unbleached), \$46 to \$47, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 to \$60, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$2.05 to \$2.10, Toronto.
 No. 1 soft white shavings, \$1.90.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.05.
 Heavy ledger stock, \$1.50.
 Primary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 95c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$5.75 to \$6.00.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.50.
 Black linings, \$1.75.

New light flannelettes, \$5.00.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3 to 3¼.
 No. 1 burlap bagging, \$1.00.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, November 25, 1914.

During the interval there has been a fairly active demand for ground wood pulp, which seems to be rather scarce. Prices were firmly maintained, and showed a sharp upward trend. Shipments on outstanding orders continued regularly. Recent rains enabled some paper manufacturers operating ground wood mills to resume the running of the latter to capacity. It was reported that one large paper manufacturer was unable to make deliveries on a certain contract on account of the shortage of ground wood. Some grinders

are holding \$18.40 f.o.b. ground wood mill as the lowest possible price for any future delivery. Other quotations vary from \$17.50 to \$18.25 f.o.b. ground wood mill.

The sulphite situation has shown a tendency to ease somewhat on spot orders. Most contracts are caught up in full now, and there are some small accumulations for spot delivery. Strong unbleached is worth from \$2 to \$2.15 ex-dock New York, according to quality. Easy bleaching is firm at \$2.20 to \$2.30 ex-dock. The kraft market is essentially unchanged. Supplies are scarce. The spot market for kraft is rather weak at 2 cents to \$2.00 a pound, while contract business is firm at \$2.15, ex-dock.

There was a market weakening in the value of rags during the interval. Roofing packings fell off about 20 to 30 cents a hundred pounds for some descriptions. Other grades dropped from ⅓ to ½ cent a pound. Foreign rags of some descriptions are now available at prices below the contract values of a year ago. Bagging is quiet and rather weak. Old rope has been featureless as far as demand is concerned. Heavy imports weakened the value of foreign grades from ⅓ to ¼ cent a pound. Current quotations are about 3 to 3½ cents a pound.

Old waste papers were fairly firm at the early part of the interval, but showed gradual weakening toward the end. Shavings held their own fairly well at 2.50c. to 2.60c for hard white, No. 1 and 1.90c to 2.10c for soft whites. Packers reported a very stiff market in the making of contracts for the ensuing year, with binderies for shavings. They contend that the current market does not warrant the high values asked by binders. Flat stock of all kinds was a little weaker. Old magazines were quoted at 80 to 95 cents a hundredweight. Ledger stock sold at 1.65 cents a pound. The demand for old newspapers was quiet, and prices were low. Mixed papers moved along quietly with a weaker tone to prices. The range for this description was 22 to 25 cents a hundred pounds.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2⅓ to 2½ delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35c delivered.
 Bleached Sulphite, impt., 2.85 to 3.05, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphate, impt., 2.00 to 2.15, ex dock New York.
 Bleached sulphate, impt., 2.80c to 3.00c., ex dock, New York.
 Kraft Pulp, 2.05 to 2.15 ex dock, New York.

Quotations unchanged for all grades of paper:—

A gradually improving condition to general business was not without effect in the local paper trade. There were many events that occurred during the interval leading to a revival of confidence, and a resultant improvement to business. The opening of the Reserve Banks throughout the country was not without its effect, as a large volume of exchange was released by the operation of the new banking and currency system. The Cotton Exchange opened with a strengthening in the price of cotton. Other exchanges dealing in securities and merchandise were also re-opened after a suspension of several months, and all contributed to—

ward a revival in general trade. The newsprint situation has remained essentially unchanged. Prices are very firm, and consumption on contract continues about 10 to 12 per cent. over the corresponding period of last year. Sheets and sideruns are moving along fairly well at current figures. The wrapping paper industry is fairly active, and prices are well maintained in all grades. Book statistics showed a reduction of the stocks on hand, and an increase in the shipment of stock to consumers.

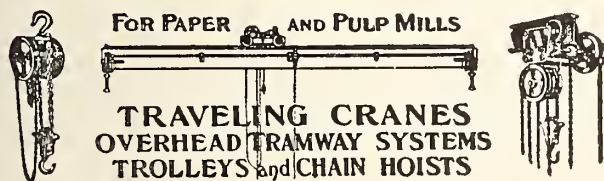
Writings, bonds and ledgers moved actively in the cheaper and manufacturers are slow with deliveries. There were several rumors to the effect that tissue had weakened considerably. There seemed to be no corroboration of these rumors, however, and prices were maintained by manufacturers despite efforts of jobbers and brokers to break the market. Boards were a little more active, and mills resumed fair running during the interval. Bags were quiet but firm in price. Specialties were fairly active at higher prices. Krafts continued to move steadily at 3¾c. to 4c. a pound for No. 1. Cigarette papers were scarce, and firm in price. Manufacturers are several weeks behind in deliveries. Toilet papers and paper towels enjoyed active inquiry.

Paper.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.30, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manilla jute, 5¼c to 5½c, delivered.
 Manilla, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$27 per ton, delivered.
 Boxboards, straw, \$25 per ton, delivered.

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 Tissue, white, cylinder, 47½ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

ST. LAWRENCE PULP & LUMBER CORPORATION Chandler, Que.

Considerable changes have recently been effected in the financial end of this firm. The interests of the Whitmer Lumber Co. having retired from this new proposition has changed the management of the plant. Mr. Racey, General Manager, will retire about the first of the year, and he will be replaced by a man associated with the new interests, whose name has not yet been given out. The pulp mill has been placed in charge of Gust. Hanson, nephew of Mr. N. K. F. Hanson of Stockholm, Sweden, a well known pulp and paper mill engineer. This company is now operating its sawmill plant, sawing about 60,000 feet per day, and has its railway plant in operation into the mill. At the present time, this plant expects to commence operation of the mill about March 1st.

This mill was designed by Mr. Hardy F. Ferguson, of New York, and built by the Aberthaw Construction Co. of Boston.

The machinery includes one large Emmerson drying machine, which is now in place, four Digesters, eight boilers equipped with automatic stokers. The company brings its wood to the mill by rail, and brings sulphur and coal by steamer, directly to the mills.

The mill is entirely reinforced concrete, and is one of the best jobs on construction, which has been carried out in pulp mills in this country.

ASSESSMENT JUDGMENT.

The Ontario Railway and Municipal Board has just given judgment in connection with the appeal of the Ontario and Minnesota Power Company against the town of Fort Frances, confirming the assessment of the town, but readjusting the figures as follows:—\$250,00 on buildings \$550,000 lands and \$480,000 business. The town increased the assessment from \$637,642 to \$1,280,000 against which the company appealed first to the district judge and then to the Railway Board, judgment being given in both cases against the company. Under an agreement with the town the assessment of this company for general municipal purposes has been fixed at \$25,000. The company owns the valuable waterpower at the point where Rainy Lake empties into Rainy River, and has constructed extensive pulp and paper mills both in Minnesota and Ontario, against which bonds have been issued for \$4,000,000. When the town assessor made a valuation of \$637,642 the company at once carried an appeal to the Court of Revision. The Court of Revision raised the figure to \$1,000,000 on the following basis: Lands \$95,000, plant \$705,000, business assessment \$200,000. The figures were confirmed by the district judge.

WRAPPED BREAD NOT IN DEMAND.

Evidently Toronto householders do not care very much for paper-wrapped bread. In the latest Health Bulletin issued by Dr. Hastings, Medical Health Officer of that city, it is asserted that the supply of paper-wrapped bread in Toronto largely exceeds the demand, and that the bakers find it left on their hands.

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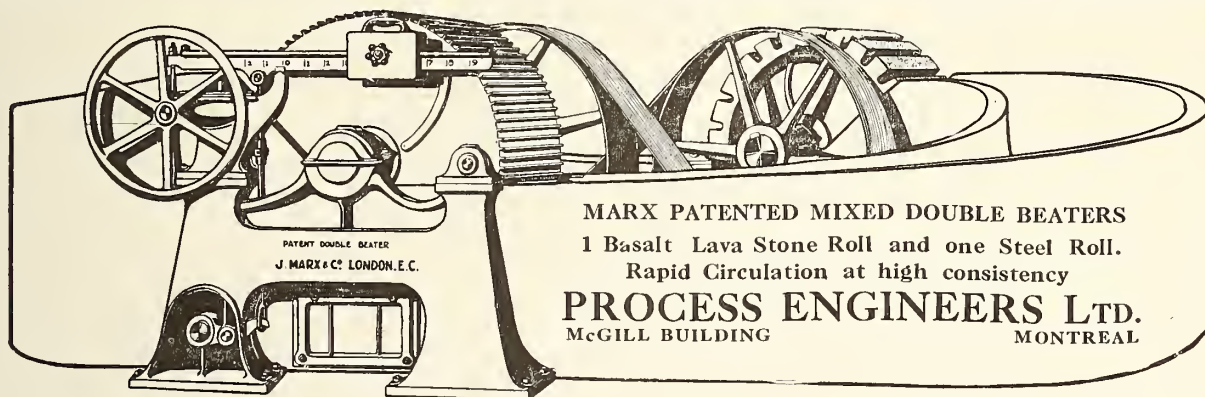
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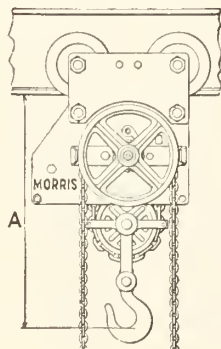
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Sizes, Folds and Equivalent Weights of British Papers. Paper Trade Customs, etc., etc.

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- Air Compressors**
Blethen, Hugh R., New York
- Air Hoists**
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Bags**
Smart-Woods Ltd., Montreal, Que.
- Barkers**
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Boving & Co. of Canada, Limited.
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Jenckes Machine Co., Sherbrooke, Que.
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Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
- Beaters**
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Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
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Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
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Reddaway, F. & Co., Montreal, Can.
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MacDougall, J., Caledonian Iron Works, Montreal, Can.
- Brass Wire Cloth, Foureinander Wires**
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
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Johnson, C. H. & Sons, St. Henry, Montreal, Can.
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Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
- Calender Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
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- Carriers**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Case Silings**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Causticising Systems**
Boving & Co., of Canada, Limited, Toronto, Ont.
- Centrifugal Screens**
Jensen og Dahl, J. & A., 1 Broadway, New York City.
- Chemicals, Colors, Etc.**
Brunner, Mond & Co., Montreal, Can.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
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Tippet A. P. & Co., Montreal, Can.
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- Chain Crane**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
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- Change Speed Gears**
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Paper Makers' Chemical Co., Easton, Pa.
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- Chippers**
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
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- Clutches**
Jones and Glassco, St. Nicholas Building, Montreal
- Cranes**
Blethen, Hugh R., New York, N.Y.
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
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- Coal Handling Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
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Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Cranes—Overhead Travelling**
Blethen, Hugh R., New York, N.Y.
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- Conveying Machinery**
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- Couch Rolls**
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
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Process Engineers, Ltd., Montreal, Can.
Sherbrooke Mach Co Ltd., Sherbrooke, Que.
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- Couplings**
Jones add Glassco, St. Nicholas Building, Montreal
- Cylinders**
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont.
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- Cutters**
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
- Cut Gears**
Jones and Glassco, St. Nicholas Building, Montreal
- Cylinder Covers**
Boving & Co., of Canada, Limited, Toronto, Ont.
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Kufferath, Andreas, Mariaweiler, Germany.
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Bertrams Ltd., Edinburgh, Scotland.
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Sherbrooke Machinery Co., Sherbrooke, Que.
- Cylinder Rolls**
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
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Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
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Boving & Co., of Canada, Limited, Toronto, Ont.
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Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Digesters**
Boving & Co., of Canada, Limited, Toronto, Ont.
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Pusey & Jones Company, Wilmington, Del.
- Digester Gauges**
Schaeffer & Budenberg, Brooklyn, N.Y.
- Drainer Bottoms**
Snell, Samuel, Co., Holyoke, Mass.
- Dryers**
Bertram Ltd., Edinburgh, Scotland.
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- Electric Cranes**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Elevating and Conveying Machinery**
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Electric Lighting and Power Supplies**
Forman, John, 248 Craig Street W., Montreal
- Evaporators**
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Pusey & Jones Company, Wilmington, Del.
Scott, Ernest & Co., Fall River, Mass.
- Exhausters**
The Sherbrooke Machinery Co., Sherbrooke, Que
- Experimental Machinery**
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Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
Pusey & Jones Company, Wilmington, Del.
- Exporters**
Parsons Trading Co., New York, N.Y.
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Pusey & Jones Company, Wilmington, Del.

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Pusey & Jones Company, Wilmington, Del.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Ont.

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Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

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Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.

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Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines

Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.

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Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.

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Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Pusey & Jones Company, Wilmington, Del.

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Collis & Sons, J., London, Eng.

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Presses

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Chambers Ltd., 152 Bay Street, Toronto.

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Pullan, E., 490 Adelaide Street, W., Toronto, Can.

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Bentley & Jackson, Bury, England.
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Emerson Mfg. Co., Lawrence, Mass.
Farrel Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
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Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, I. & Co., London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Pusey-Jones Co., Wilmington, Del.
Rice, Barton & Fales Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmaley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachometers

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester

Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.

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Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.

Pneumatic Chain Blocks

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Process Engineers Limited, Montreal, Can.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.

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Stancliffe Estates Co., Ltd., Darley Dale, England

Pumps

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
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Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Pusey & Jones Company, Wilmington, Del.
Smart-Turners Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Recording Gauges

Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

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Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
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Boving & Co., of Canada, Limited, Toronto, Ont.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rope, Cotton and Manilla

Jones and Glassco, St. Nicholas Building, Montreal

Rosin Size

Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers

Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd. Montreal, Can.

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Rotary Sulphur Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.

Runways—Hand operated

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls

Boving & Co., of Canada, Limited, Toronto, Ont.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens

Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N.Y.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
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Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs

Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Pusey & Jones Company, Wilmington, Del.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces

Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters

Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator

Pickles, W. F., Buckland, Conn.

Stuff Chests

Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch

Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y.

Sulphate Mill Equipment

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.

Gauges

Schaeffer & Budenberg, Brooklyn, N.Y.

Generators and Transformers

Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.

Governors for Electrical Driven Grinders

Jensen og Dahl, J. & A., 1 Broadway, New York City.

Governors for Water Driven Grinders

Jensen og Dahl, J. & A., 1 Broadway New York City

Grinders

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.

MILL SUPPLIES---Continued

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto Ont.

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Strainers
Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery
Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulp de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatchouan Falls Paper Co., Ouatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manila,"

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, $1\frac{1}{2}$ cents each.

Railway ties, nine feet long, $1\frac{3}{4}$ cents each

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor
 Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks."
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Northworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art
 Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere
 Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merrittton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merrittton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merrittton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merrittton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New-
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnocona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merrittton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merrittton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merrittton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverville, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R., Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal, Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," Hercules Manilla, "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co., St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Crendon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

PAPER MAKER, experienced, now open for engagement in any responsible position at mill or sales office. Highest references. Apply Box 92, Pulp and Paper Magazine, Montreal.

PULP ENOUGH TO SUPPLY THE WORLD—Now is the time to secure your supply of pulp for the next ten years and avoid the possibilities of higher prices. Inquiries invited. Address, F. E. R., 404 King's Hall Building, Montreal, Que.

OWN YOUR OWN PULP AND TIMBER LIMITS—Buy now on easy terms before the prices double. Full particulars on application to, Pulp and Timber, care Pulp and Paper Magazine, Montreal, Que.

FOR SALE 150in. Double Drum Winder, complete with slitters. This winder is in excellent order and can be seen in operation. Apply Box 94, Pulp and Paper Magazine, Montreal.

ENGINEER—Familiar with Sulphite and Board Mill, must be good draughtsman, write stating experience and education. Box 955, Pulp and Paper Magazine, Montreal.

FOREMAN wants situation in Paper Mill, at present foreman in English mill making high class paper. Used to Banks, Bonds, Writings, Accounts Vellums, Deckle Edge Note-Paper and Antique. Age 37, married, total abstainer. Thoroughly familiar with all machinery used in the production of the papers mentioned. Box 96, Pulp and Paper Magazine, Montreal, Que.

WANTED—Position as officiating millwright and caretaker of paper machines, thoroughly qualified and reliable, best of references. Apply, "Unemployed, Pulp and Paper Magazine, Read Building, Montreal.

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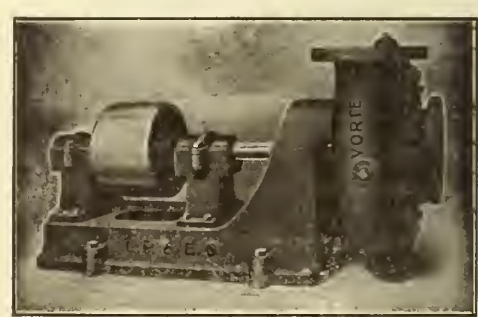
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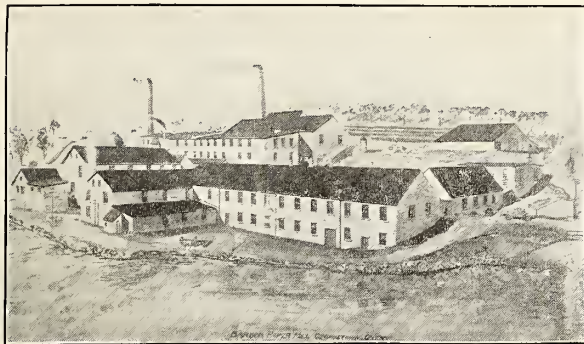
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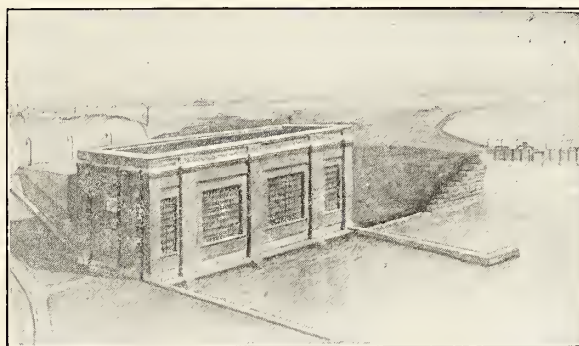
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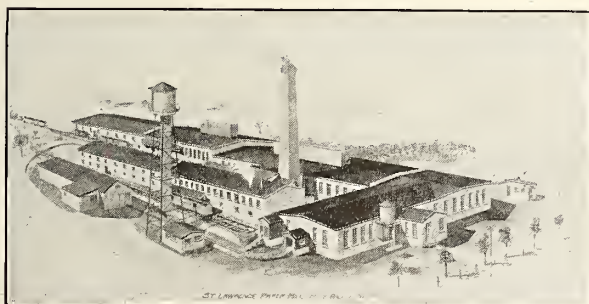
Barber Paper Mill, Georgetown, Ont.



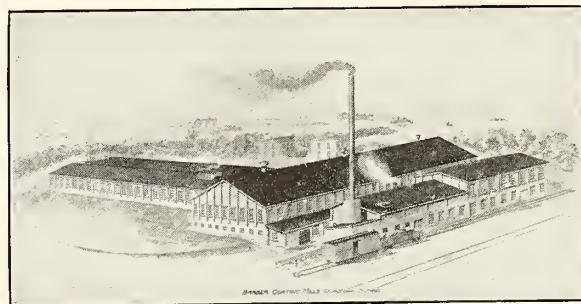
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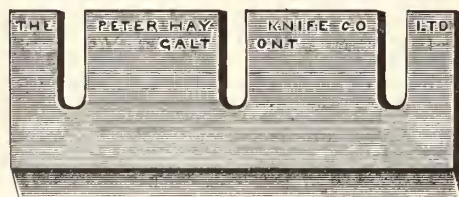
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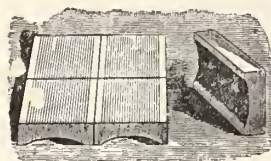
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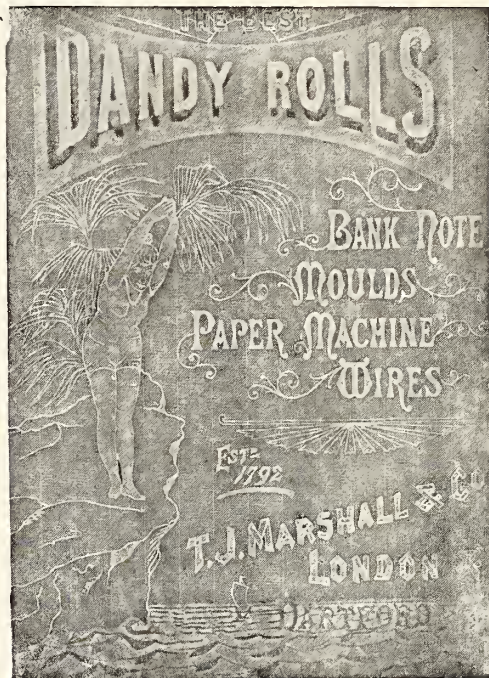
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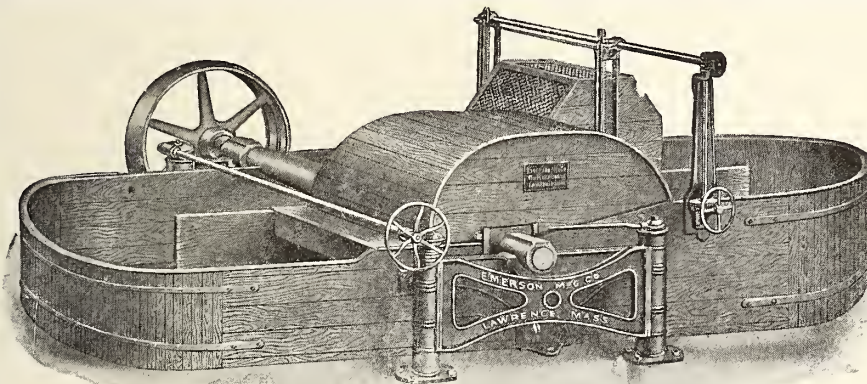
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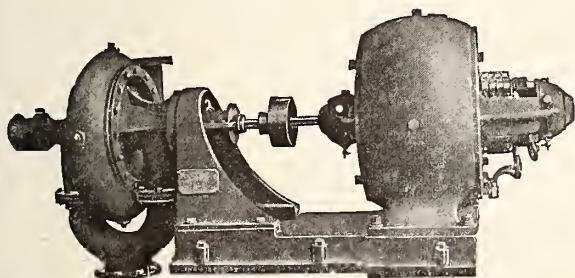
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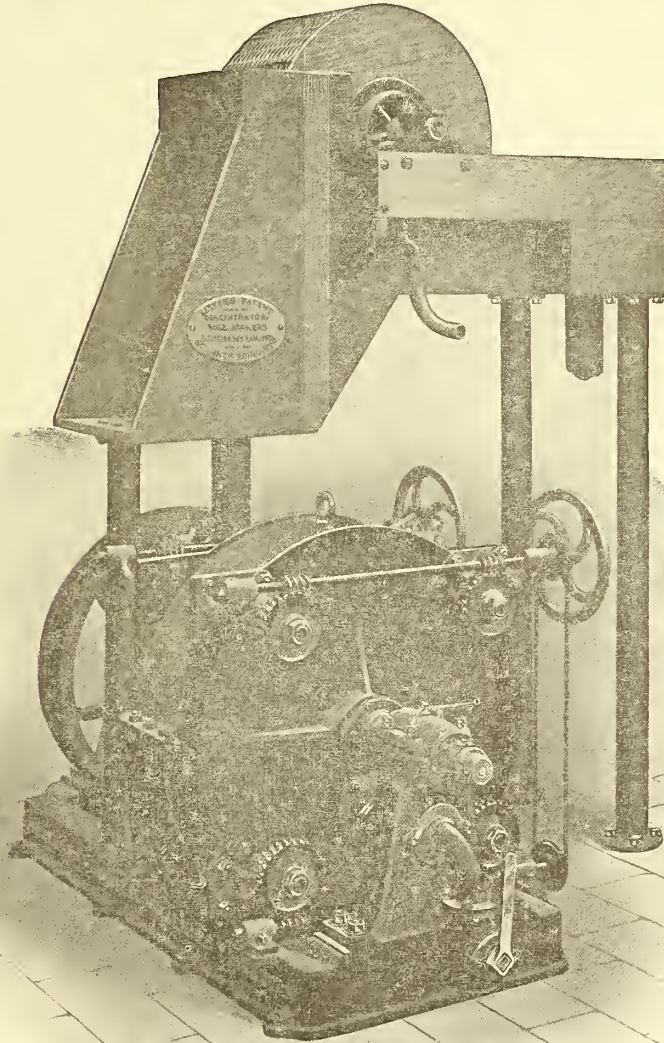
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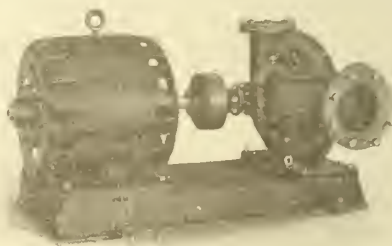
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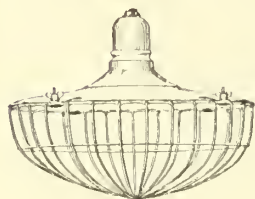


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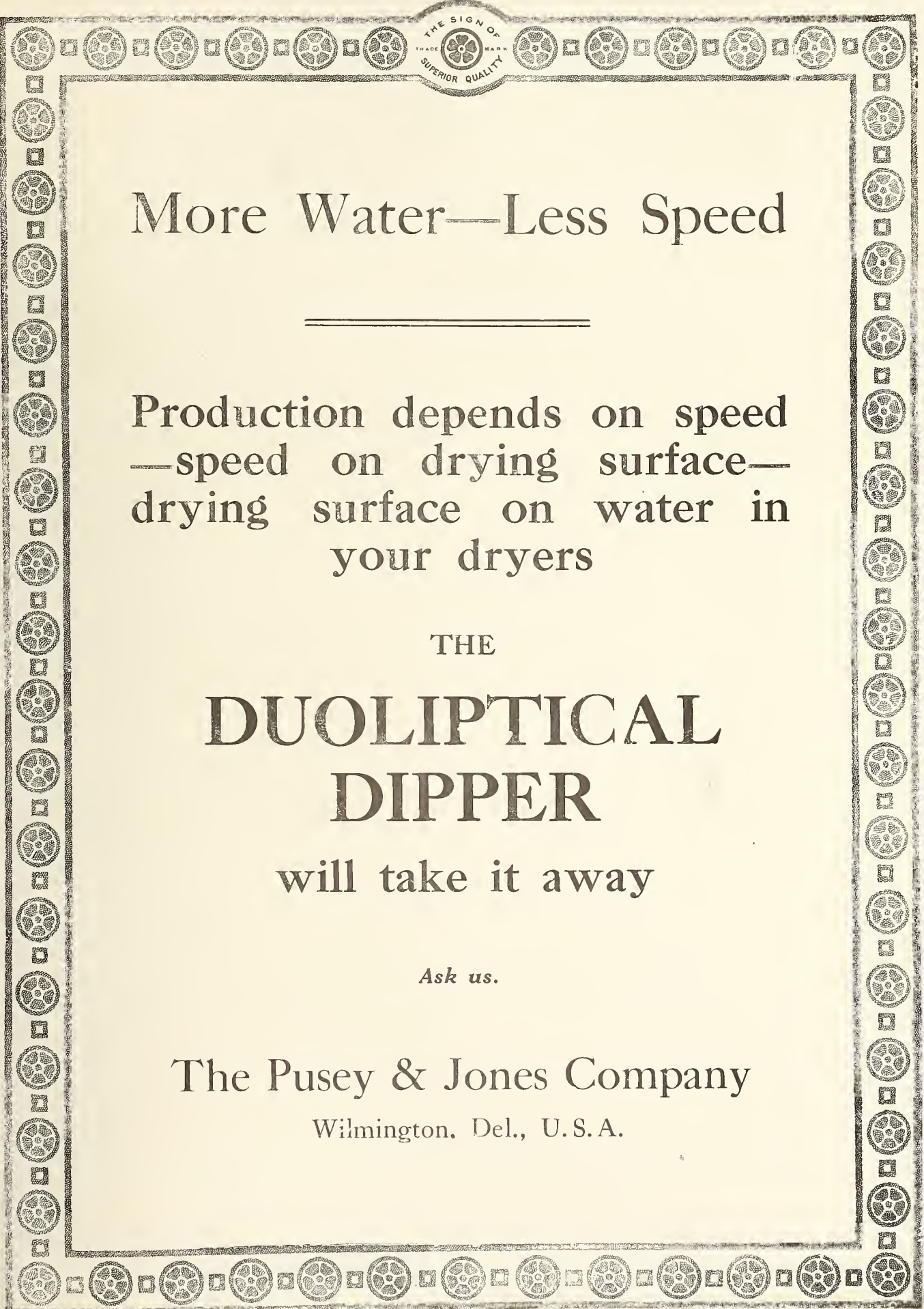
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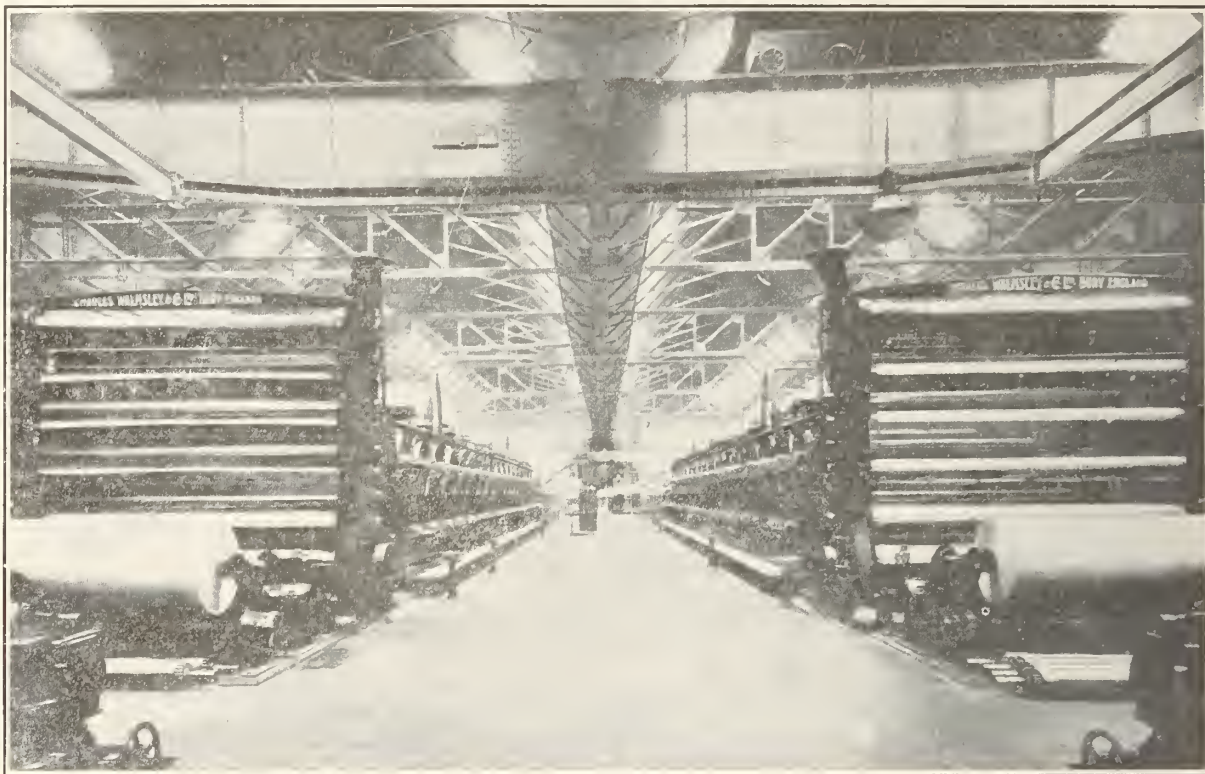
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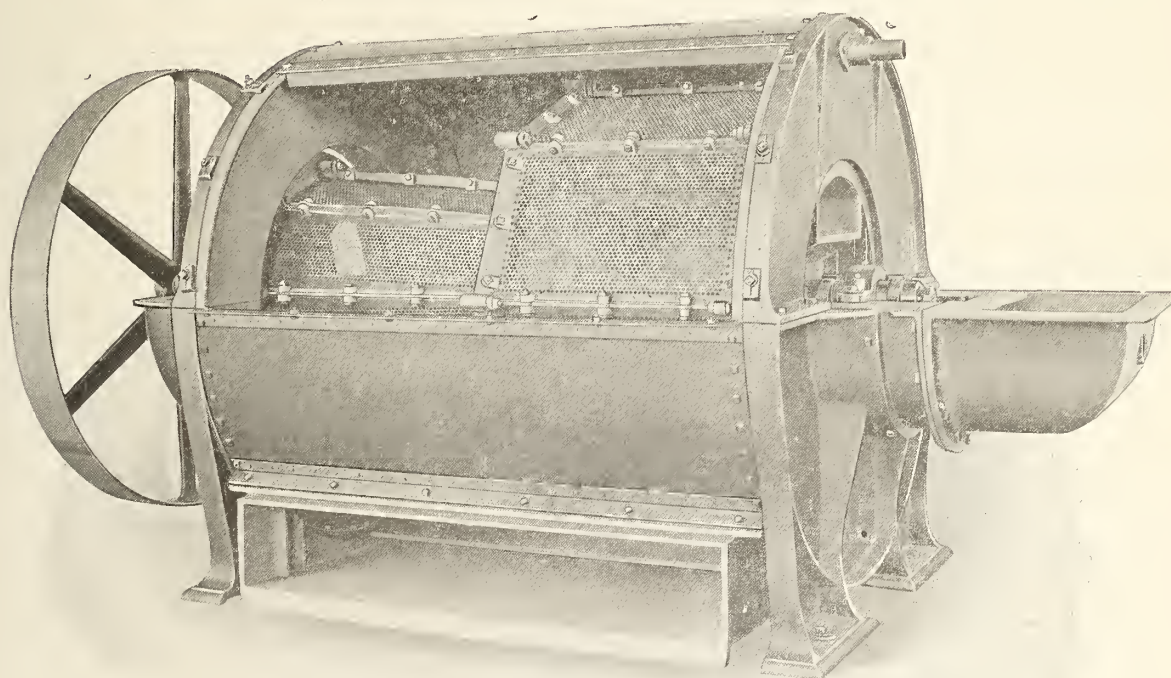
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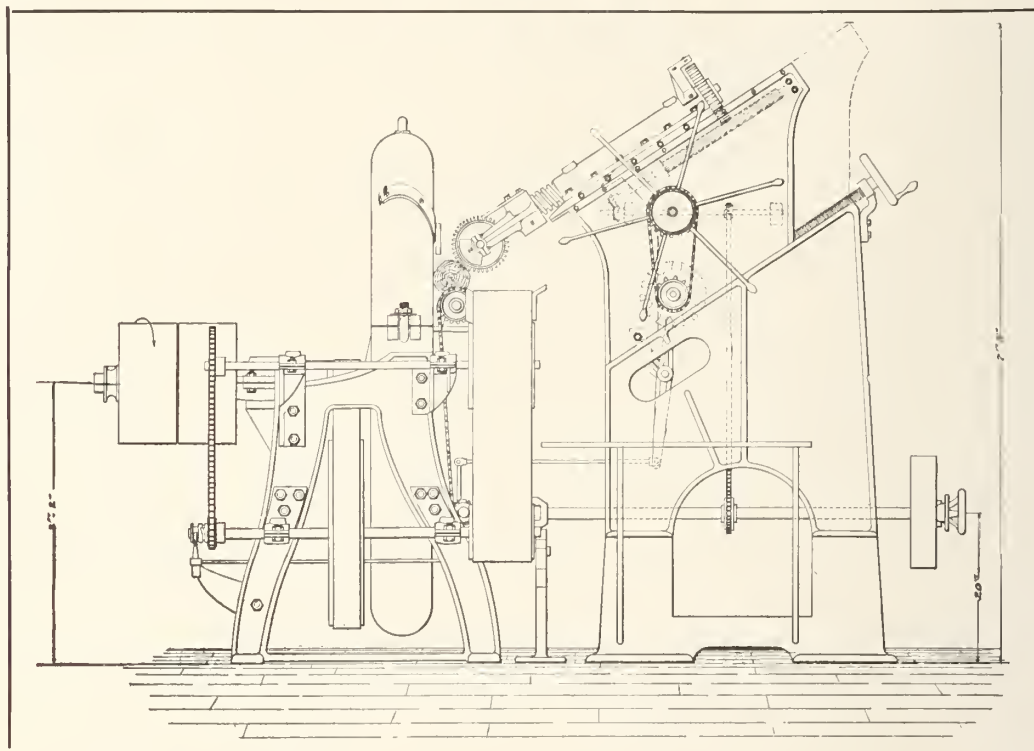
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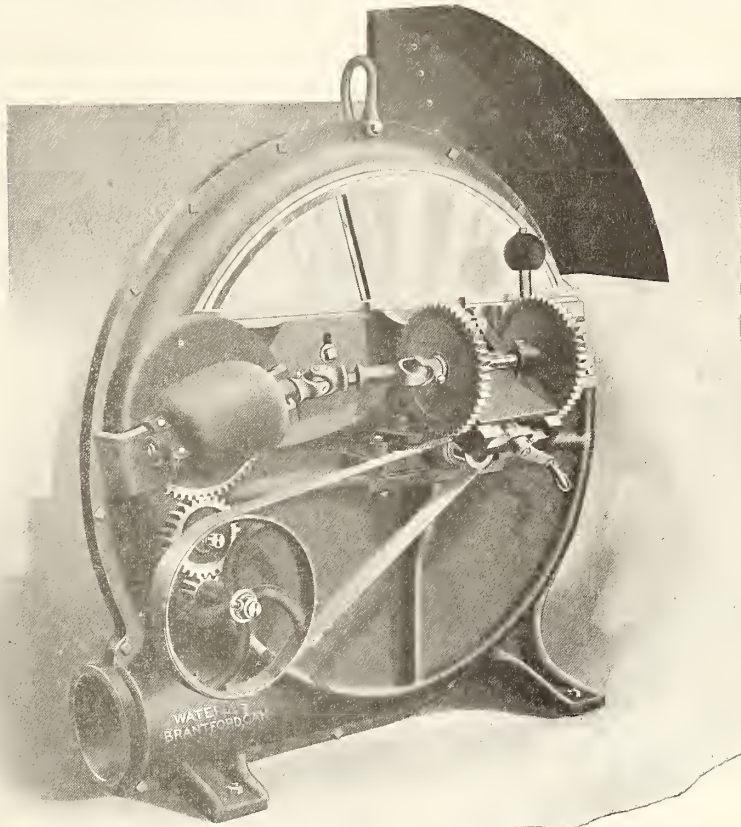
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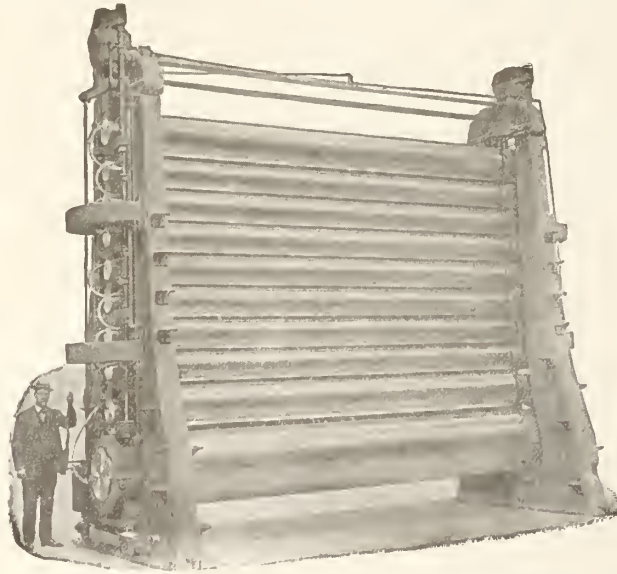
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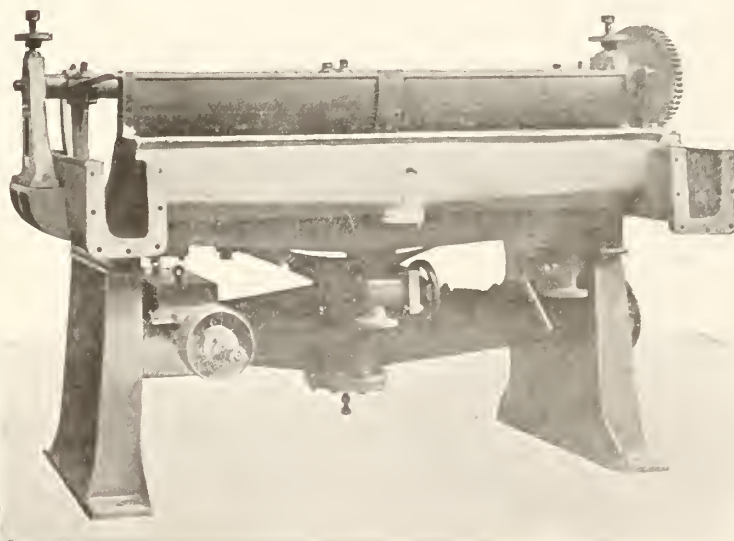
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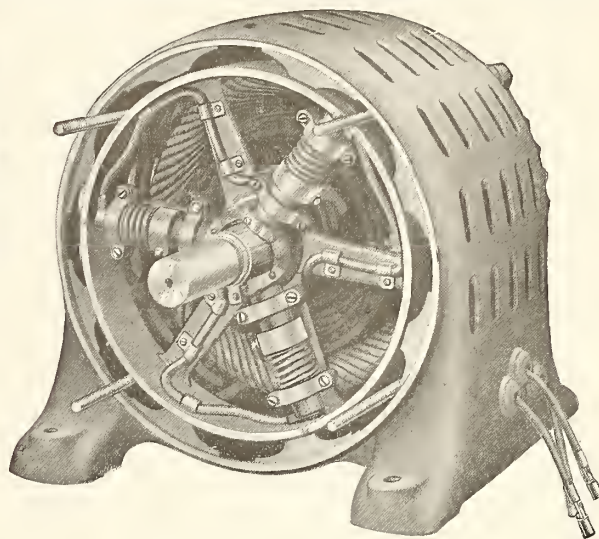
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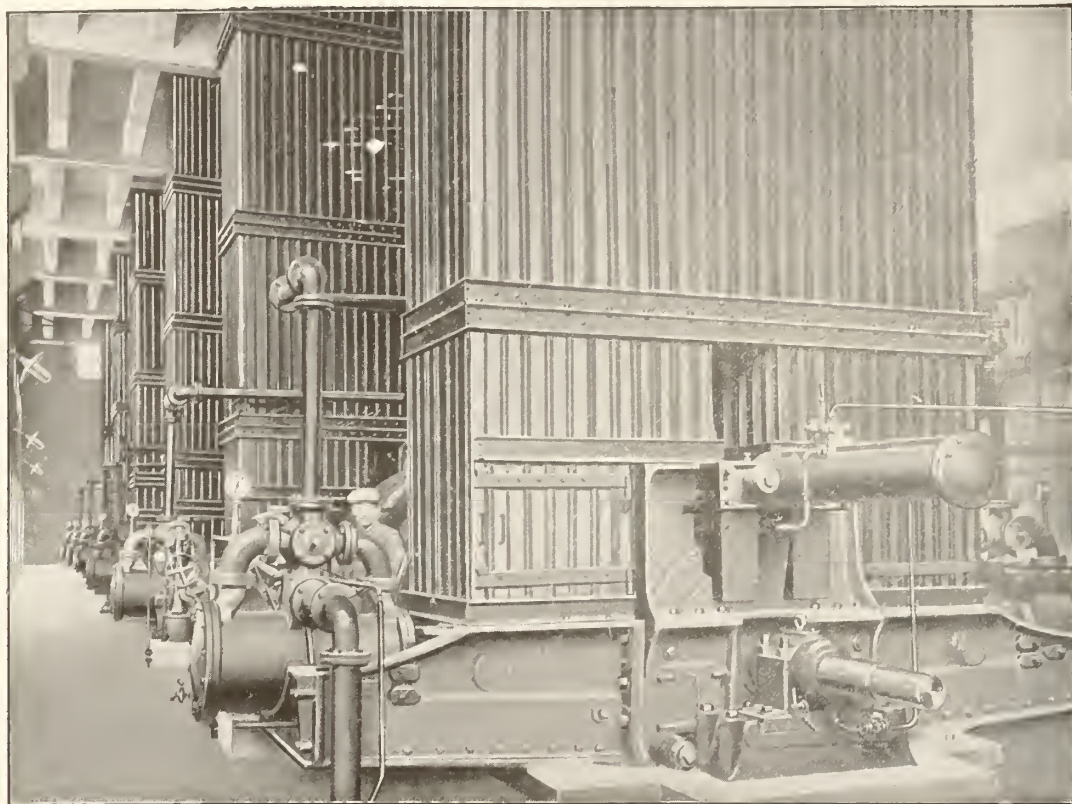
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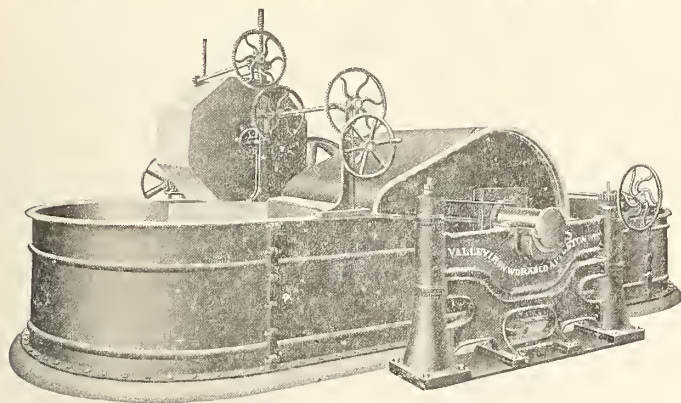
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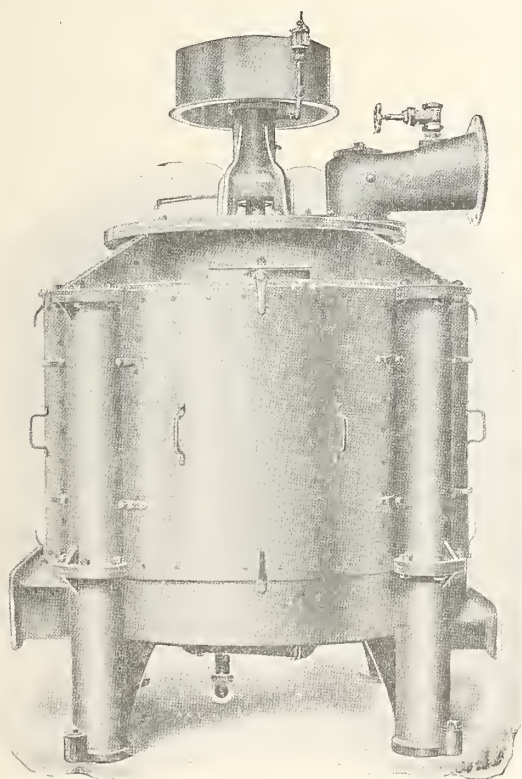
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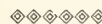
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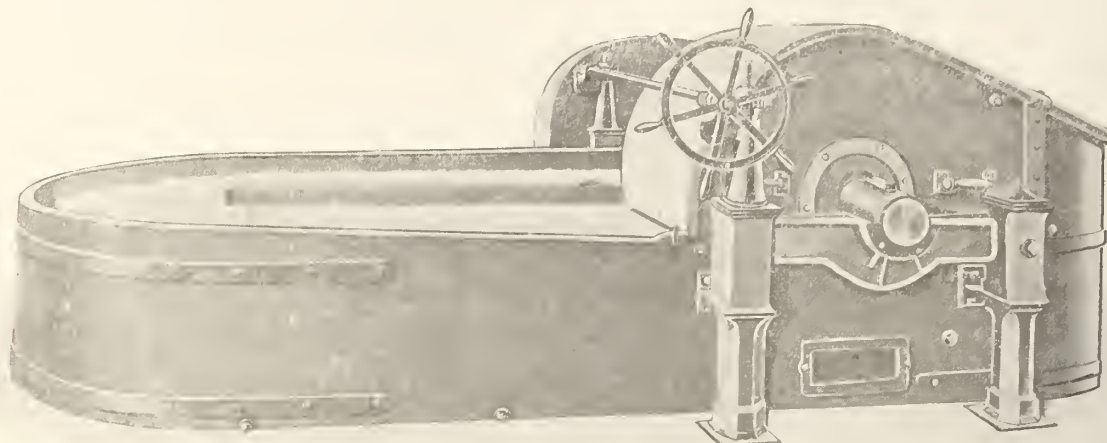
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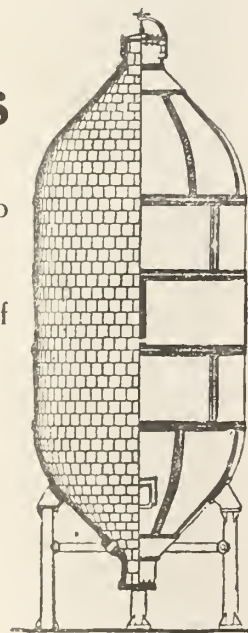
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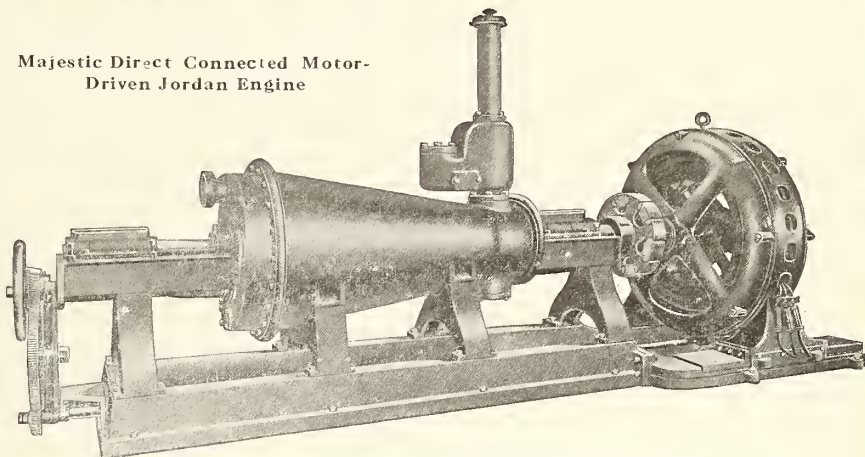


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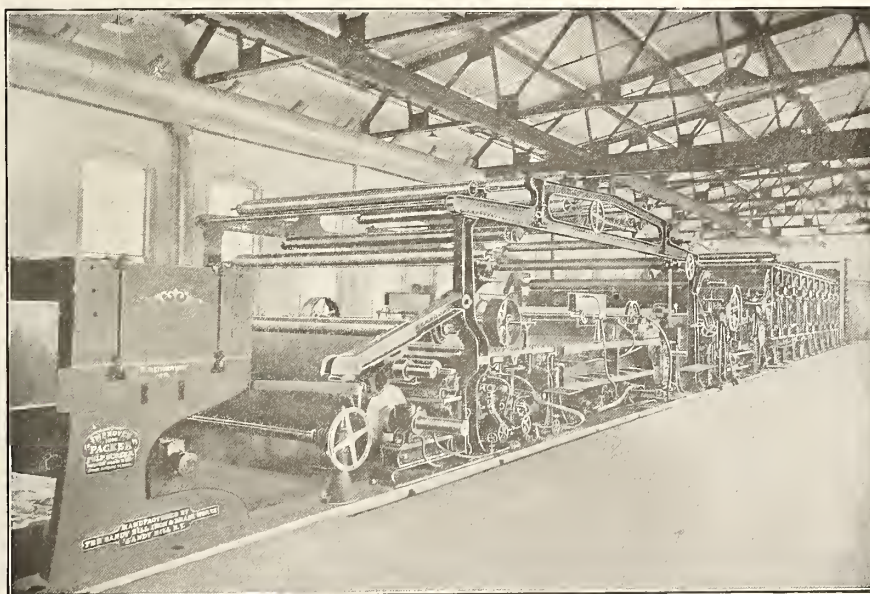
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VOL. XII.

MONTREAL, DECEMBER 15, 1914

No. 24

Business Outlook

The business outlook, according to the latest word from financial authorities, is steadily improving. Canadians have received over \$40,000,000 worth of war orders already. Just last week another \$5,500,000 was added in orders to the steel companies of Canada who are capable of making shells, which will be used on European battlefields. These will serve to keep the wheels of industry turning. Failing genuine progress it will at least provide temporary work for thousands of men.

Farmers are due to receive \$20,000,000 for their produce over and above what they got last year. Betterment will undoubtedly come as a reflection of better times south of the boundary, where from Boston to San Francisco United States industries report some improvement. Shipments of produce are particularly pronounced. Conditions are undoubtedly bettering. Although undergoing temporary quietness, pulp and paper makers appear to be agreed upon this point.

Technical Education for Paper-Makers

"Technical education" is the term designating the special training of persons in the arts and sciences that underlie some trade or profession. It is usual to restrict the term to the special training which helps to qualify a person to engage in some branch of productive industry.

Systems of technical education as we know them to-day arose to meet the altered conditions of production of the 19th century. Steam power was coming in, division of labor was getting down to the

point where it was at once necessary for the successful worker in most professions and industries to have a thoroughly good knowledge of underlying natural laws and the best methods of production, and it was also practically impossible for the apprentice to learn much from journeymen or masters. There was also an awakening to the absolute necessity of allowing education in its higher branches to be applied to some other than merely academic ends.

In all the Continental countries there sprang up continuation schools, night schools, and technical institutes. They filled a great need, and their influence and popularity spread through every class of society.

There has since been built up in the last quarter century a structure of technical education which is simply marvellous. The tremendous industrial advances which have been made in England, but more notably in Germany, have been largely due to the wonderful systems of training in professions and trades.

The German boy who decides upon an industrial career after receiving his primary education, may still go on in the "Fortbildungs-Schulen" or continuation classes, or may enter the "Fachschulen," or apprentice schools. The "technische Hochschulen," or schools of the University type, in which the education has special reference to industrial purposes, stand ready to receive those who have broad qualifications, even though insufficient to warrant a University course. Engineering is the basic study, and in these schools engineers of every description, architects, builders, and a great number of manufacturing chemists find the scientific and special training they need. In some of the larger institutions, such as that at Charlottenberg, near Berlin, ample facilities for research are given.

In Britain, technical education has gained a great hold. Even the University of London makes special provision for those who have a desire to specialize in industrial pursuits. It is being broadly recognized that to fail to bring educational facilities within the reach of every person who has the desire to use them is to stunt national development. Before the modern industrial era, education was smothered under the tradition that it was only for the "learned" men of the land. Now the tendency is to urge upon one and all the immense importance of combining a theoretical knowledge with practical experience. To quote a British authority, "The conviction has been steadily gaining ground that success in manufacturing industries, in the higher walks of commerce, and in every pursuit requiring technical knowledge upon the thorough and complete training of those who are charged with the control of the different kinds of work."

The art and business of paper making is one which will gain immensely by the introduction of technical education. Britain, France and Germany all have famous paper making schools. In the United States there has already been instituted at least one devoted exclusively to paper, and all the better technical institutes arrange for specialization in pulp and paper.

So far, in Canada, the pulp and paper industry has suffered along with almost all others from the lack of facilities for the technical education of those engaged in it. That technical education would prove an immense benefit is undeniable. The more experienced a man in the business the more clearly he realizes how small his knowledge is, the more he yearns for a clear understanding of the basic principles which govern the various physical and chemical changes which take place in his sheet as it goes from the wood room or the rag room to winding-drum. A paper chemist or engineer never ceases his investigations and experiments. Theoretical and practical go together to advance the knowledge of the fascinating process.

It is the function of schools to be a clearing house for ideas. This would be the outstanding feature of any school of paper-making which might be established in Canada. Co-operation and interchange of thoughts and experience are greatly needed. Until the time comes when an institution for the education of the boys destined to take up paper-making is required, the Canadian school will have to be among those who, already occupying positions of responsibility, believe that in co-operation the only hope of advance lies.

The question is: How can this be accomplished? What can paper makers in Canada do to improve conditions for technical education among themselves and their younger employees? A move of some kind is a great necessity.

The Pulp and Paper Magazine has been investigating this question quietly among paper makers, both those who have had training in Universities and technical institutions, and those whose training has been in the mill alone. All agree that something should be done,

but opinions vary. In order to bring the matter to a head we have asked Mr. T. Linsey Crossley, who has been interested in this matter for a number of years, to outline a plan. This will be found on a later page. Mr. Crossley submits his ideas for the purpose of arousing discussion. The Pulp and Paper Magazine extends to all readers an earnest invitation to think the matter over and write their ideas for publication in our columns. This is something in which the judgment of all is needed.

In this connection it is well to give particular prominence to the views of a pulp mill manager whose insight into these affairs is particularly deep. In a free discussion of Mr. Crossley's plan he says: "The suggestion of a travelling instructor is well worth thoroughly investigating. Upon looking into the matter, however, I think that the most likely scheme would be to institute a short course in Montreal, with the Magazine, Laboratories, Association, McGill University, instructor, and everybody else to do their part. It would not be difficult to persuade each mill to send two or three of their men for such a course, or at least allow them their time while they went. This might not be the way to gain the end, but will certainly be a good idea, on account of the fact that the Summer School idea is pretty well endorsed by the people in this country, who have heard of them in connection with teachers, engineers, farmers, etc." The writer adds that a few days spent in examination of each of the various kinds of mills—ground wood, sulphite, sulphate, soda, etc.—would have a most beneficent effect.

The question of technical education is open for discussion. We hope that our readers will write frankly and fully their views.

The Spanish River Case

The Directors of the Spanish River Pulp and Paper Co., Ltd., have issued a notice to their first mortgage bondholders that there will be a meeting in London on December 23rd to secure assent to a scheme to assist the Company from a financial hole. The scheme proposed is that the bondholders and noteholders of the three companies should agree to the funding for an average period of seven years of four half-yearly coupons—say, two years' interest. The two years' interest so funded will be increased by compound interest at six per cent per year for the seven years and the regular payment of coupons will be resumed after the lapse of the two years, the sinking fund also to be cancelled for a period not exceeding five years, and the noteholders of the Spanish River Company and Lake Superior Paper Company to agree to an extension of repayment of the principal for two years from each maturity. The funded interest will be represented by notes or certificates of the company which will be payable seven years hence with the compound interest added and will

be secured in the same manner as the coupons which they represent now are, and for which they will be exchanged. These notes the company will endeavor to issue in the form of a security which will be negotiable.

It is understood that the company had the money ready for the required purpose, but owing to the difficulties arising out of the war were unable to secure the necessary working capital to proceed with woods operations. However, they determined to safeguard the future production of the mills by securing their supply of raw material, and are now endeavoring virtually to have this course justified.

It is to be hoped that the company can make the necessary arrangements to tide them over the difficulty. It is a lamentable truth that they have a crushing load of overhead charges to carry.

The Spanish Company and the Lake Superior Company had altogether \$722,013 to pay as interest on funded debt, and other loans and proportions of discount on notes last year.

On a basis of about 400 tons of newsprint per day, or 120,000 tons per annum, a liberal estimate, the overhead cost per ton is about \$6.00.

This is a condition which disheartens all who have the pulp and paper industry at heart. The Spanish River Company has a good plant, good power, a fairly good supply of wood, and opportunities for expansion. But "finance" has injured it grievously.

Whatever may be the outcome of the present awkward situation, it should be a lesson for once and for all to the Canadian pulp and paper industry to keep good sound enterprises clear of the rocks of manipulation.

PAPER MACHINE EFFICIENCY

By JOHN W. BRASSINGTON

(Written Specially for Pulp and Paper Magazine)

Let us, in order to help point the moral of this writing, try and express the mechanical efficiency of a paper machine in terms of some definite measure, the value of which will be obvious and easily grasped by the mind. Such a measure of value for availability as a practical unit in the mill should not in any sense be a function of first cost, upkeep in repairs, labor cost, running expense, etc., it should be a measure of mechanical efficiency only. An expression covering the commercial efficiency of a machine would include in its terms not only the statement of mechanical efficiency, but also would cover the charges against such a machine for interest on first cost, insurance, average repairs, power cost, clothing, labor, lubrication and supplies; it would also cover the purchase and delivered cost of the raw material used, together with the selling price of the finished product it furnishes as output.

Let us assume that a hundred per cent paper machine would make one thousand pounds of news per inch of face of wire between deckles, a twenty-four hour day under average conditions, and also that it would make five hundred pounds of book paper per inch of face of wire between deckles in the same time. Such an assumption gives us at once a standard of measure and a unit of value by which we can compare different widths and makes of paper machines, one with another. The absolute veracity of such a unit as we have here adopted is not of moment, all we care for in considering its value is, whether it gives comparative values of real use between any two of any number of machines. It is evident that as long as the kind of paper being made is the same on any two machines, that this method of comparing the outputs of the two is just and fair, giving a true balance of efficiency between such two machines. Such a comparison covers all contingencies, such as relative speed, amount of broke, condition of machine, capacity of dryers, regularity of drive, shake indicator diagram, etc., etc.

Any great disparity between two given machines in mechanical efficiency as expressed in this manner would indicate serious trouble in one or more of the governing causes, partially listed above, in the case of the poorer machine. There are paper machines in operation at the present, both book and news, giving an average efficiency factor of 70 per cent and over; quite recently a paper machine survey and report, made by efficiency engineers, resulted, when the suggested improvements were made, in a jump of efficiency from 48 per cent to 72 per cent.

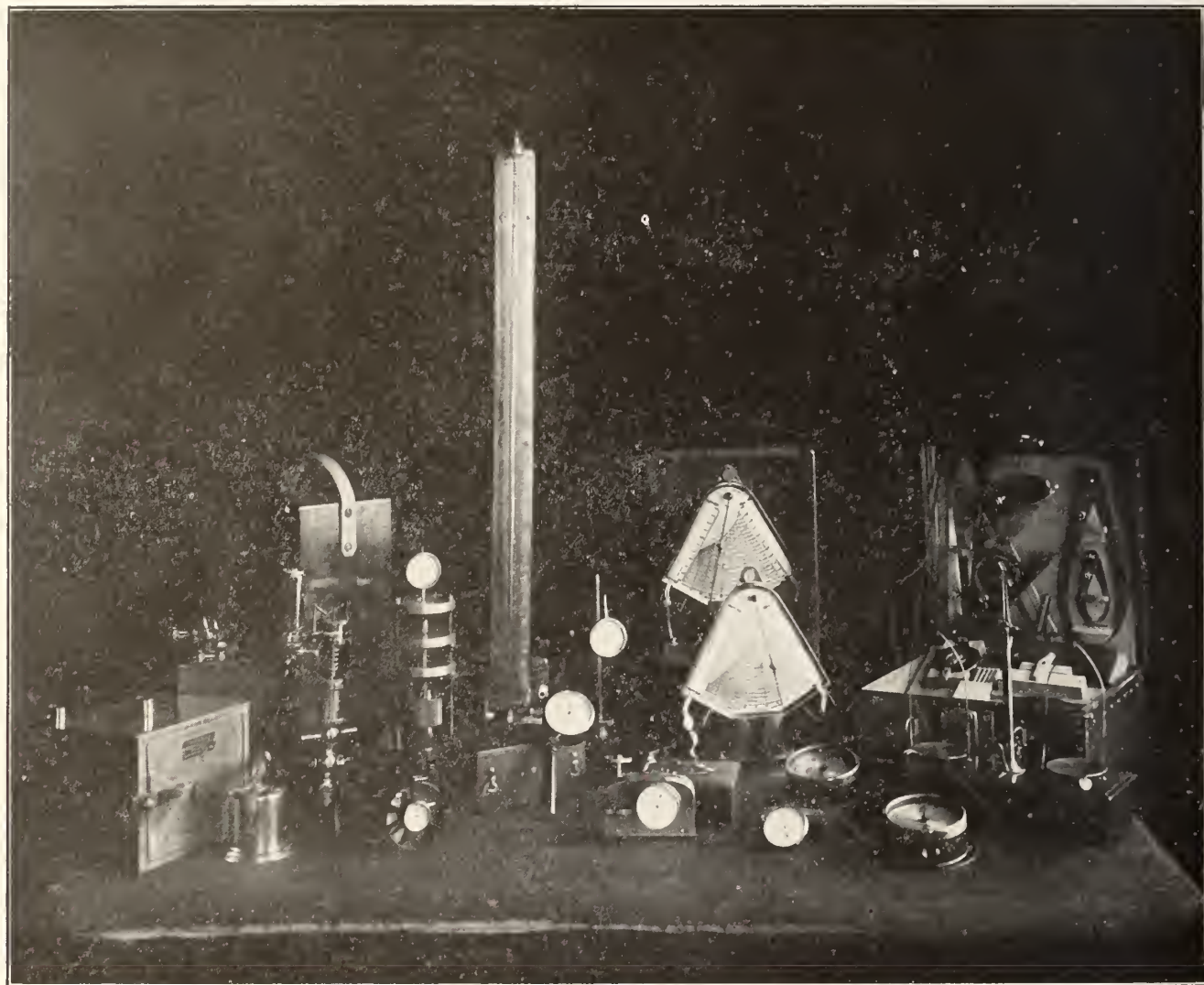
A prominent firm has been so encouraged by the satisfaction given their customers and expressed by them as resulting from paper machine surveys, that they now offer to make a report based on careful observations, made by competent men, with instruments of precision on any paper machine now in place. The object of such a report being to indicate to the owner of the machine the correct changes to make, in order to increase the efficiency of the machine.

It is probable that any paper machine now in operation is susceptible of improvement in efficiency, and would respond very promptly to treatment based on a diagnosis, made by a careful survey. Paper machine efficiency engineers, when invited to do so, visit a mill with the sole object of studying the feasibility of increasing the output and quality of product of the paper machines in that mill. It does not matter who built the paper machines; all machines may be benefited by such an investigation, and its resulting applied improvements. None of the older paper machines should be allowed to remain in the the well worn ruts of the years that have gone by, and be expected to compete with younger and improved rivals, the difference in efficiency is too great.

Paper machine efficiency engineers attribute the larger part of their success in every case in the past to the whole hearted support of the personnel of the mill; it is the combination of the intimate knowledge of the

mill force with actual working conditions, together with the experience such investigators have gained in other and similar cases that accomplishes the major portion of the work. The small remainder of the survey is, however, almost as important; it is, so to speak, the Keystone of the Arch; this is the careful record of the physical conditions maintained in and about the paper machine under construction. Instruments of precision are used for this purpose, curious in appearance and interesting in construction, they are almost infallible in pointing the way to better things, when the records they each furnish are tabulated with one

every dryer, of steam header and of water header; Pressures in steam header, in water header and dryers; Weights on couch arms, press arms, location of same and resultant pressure per inch of face of rolls; Inclination of wire, size, spacing and diameter of table rolls; Description of furnish, percentage of water in paper at couch, pressers, dryers, and calenders; Indicators cards from shake—type and periodicity; Head on slices; Suction box data; Speeds of peripheries of all rolls, direction draw and lead of paper; Condition of drive, power required for same,



PART OF A PAPER MACHINE TESTING OUTFIT.

another, and a mental composite picture of all conditions is so fashioned.

Let us go into the machine room and observe those two engineers making observations, glancing as we go by at the blank report forms one of them has pinned to a small drawing board, preparatory to transferring to them a fair copy of the notes each is making, as they take periodical readings of the instruments they are now using. Here are some of the headings:—

Temperature of air inside machine room, and outside; Humidity of atmosphere at the different parts of the machine and outside the building, direction of air currents; Temperature of

causes, if any, of useless power absorption; Strains on wires, felts on presses, uniformity of stress in dryer felts, conditions of stretchers for clothing at time of observations; Average life of clothing; Strength, weight, finish and quality of paper; Present efficiency, possible efficiency, recommendations.

Here is a ventilation chart; there a tabulation of the diameters, eccentricity and noticeable temperature indications of local troubles all concerning the dryers; type of traps, joints, and steam consumption, etc.

We show cuts made from photographs of some of the instruments.

Let us follow our friends down the machine, they are taking readings of the speeds, and listen to their conversation:—

“Breast roll 18in. diameter. 174 feet per minute.”

“Couch roll 18in. diameter. 174 feet per minute.”

“1st press roll, lower, 18in. diameter; 175 feet per minute.”

“Better try that again, that does not sound fast enough, This is a suction couch roll you know.”—A slight pause—“175 feet, that’s right,” confirms the man with the instrument.

“2nd press roll 18in. diameter, 177 feet per minute.”

“Slow, again; are you certain?”

“Yep! No weights on the levers on tending side, small weight on short arm on driving side.”

“How is she working? Crown look right?” etc., etc.

Later on we find our two investigators making notes of say the temperature of the dryers.

“Pressure gauge is out of order, reads too high.”

Steam header 212 deg., wonder they don’t cover that.”

A pause. “3rd dryer, 19 deg. F. coated with fluff.”

“Steam joints too tight and leaking, water in dryer.”

“Poor lead of paper, flaps badly one inch off centre.”

“Wet felt.”

“Is that tightener traveller stuck?”

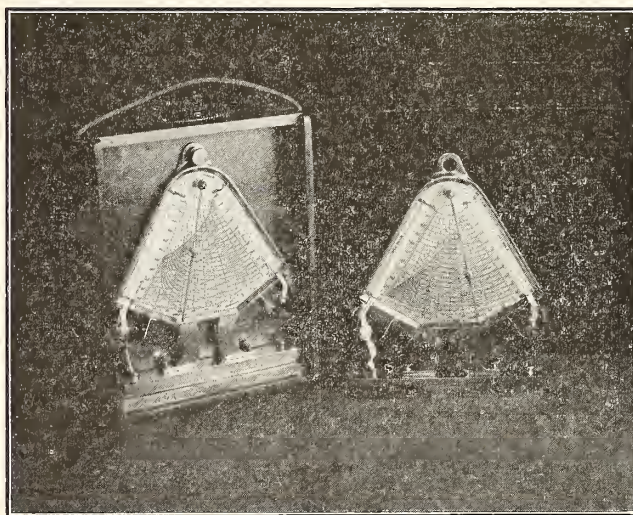
These remarks are disconnected, not to say enigmatic, yet it seems to bring the reader nearer the facts than to put them down for his information. It is nothing unusual for such a survey as we have partially outlined to take ten days or two weeks, and then some days more before the different data can be correlated and a valuable opinion given. Sometimes it is an elevating device on the Fourdrinier, again a readjustment of table rolls, here a proper relationship between crown, weights and rubber covering, there a smoothing press, here more dryers or a different steam distribution, again the loss of efficiency may be due to lack of balance of the rolls, or even in cases to improper stresses on felts; often poor ventilation takes its toll from the possible efficiency of the machine.

In short, this survey work is worth while, its exponents are invariably enthusiastic and as they gather experience, are themselves becoming more efficient. This natural development of the efforts of all mills to improve efficiency is thus rapidly crystallizing into a real way to gather and use the information that has so long escaped our notice in the good old days of large profits and careless indifference to details.

As for results taking into account the cost of changes in some cases to the best of the writer’s knowledge and belief, these are approximately the facts—By spending all the way from five to ten per cent of the first cost of the machine, the efficiency has been improved say from 50 per cent to 70 per cent; this means a total maximum increase of production of 40 per cent. The paper mill manager who recently stated that paper machines can be run too fast, is absolutely right, but it is a pity to apply his remarks as though they referred only to the paper machine. The paper machine, as the final production unit of a paper mill is naturally the epitome of that mill’s efficiency and its speed of production should be always timed to the speed of production of the mill which is synonymous with the mill’s greatest efficiency.

During a period of four or five years, the writer was personally engaged in and had full charge of a systematic investigation of mill economy, during which time innumerable tests were made, periodical

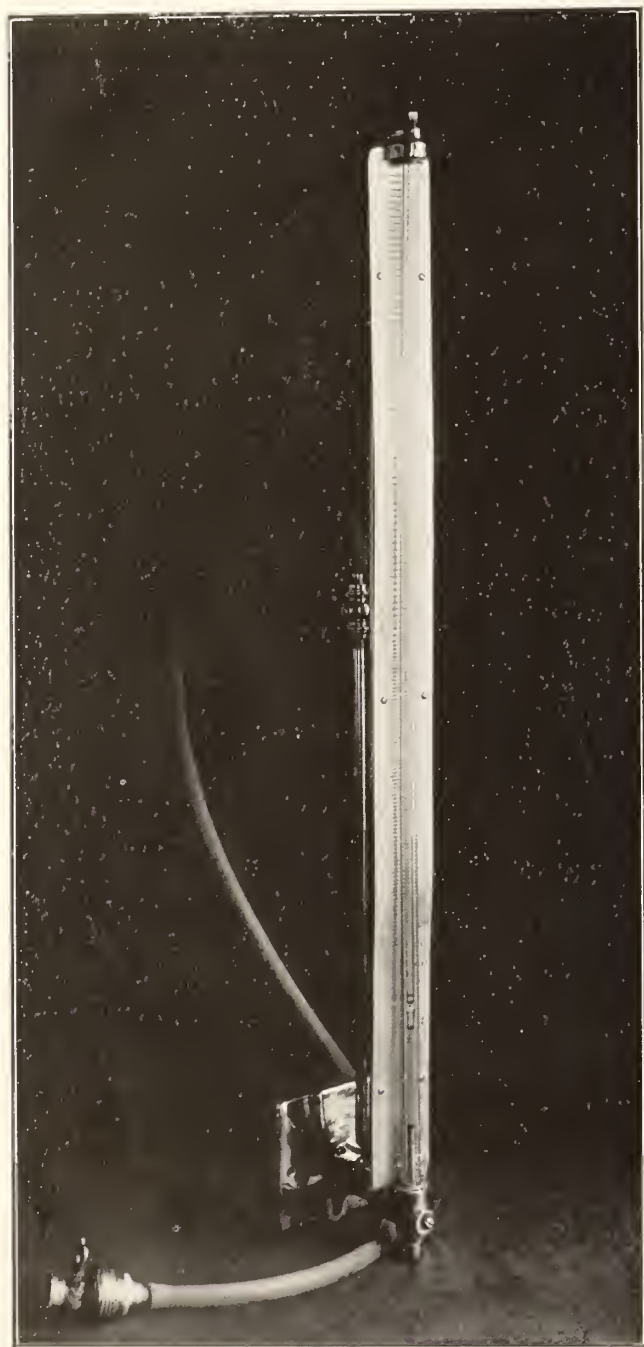
reports based on the results of these regularly recorded and monthly balance and cost sheets tabulated therefrom. It is not long, a matter of about ten months or a year, before this study of economic output and cost of production begin to show clearly that in any mill, manufacturing any standard product, there is a definite point in the production curve that is the peak of economical production for that mill. The standard of economical production is, of course, the composite result of the efficiencies of the many smaller units that each contributes its share in the total results; the efficiencies of these smaller shares cannot but vary as each of the smaller units becomes run down by want of proper upkeep, or is furnished up by expensive replacements and repairs. On the whole, however, providing no great changes in layout and machinery are undertaken, the maximum productive capacity giving the maximum economy in cost of manufacture per unit of product or per thousand of yield of any given mill, will remain practically constant. It should be the object of the competent mill manager either to know and stick to this actual economical maximum of product per unit of time, or else find out where to spend money and effort in order to increase this capacity thus economically limited by actual conditions.



TWO HYGRODEIKS.

In case the thought here submitted as a fact is not absolutely clear, let us imagine a suppositious case. Suppose we have any mill turning out so many thousands of pounds of product every day at an actual cost of say \$15.00 a thousand pounds, of which we assume \$5.00 represents raw material which is practically a constant charge outside of market variations. There is also a charge here included in the \$15.00 that is constant in actual quantity yet variable when stated as a percentage of cost per unit of production; that is the charge that consists of interest in investment, insurance, constant salaries, etc. etc.; this for the sake of this argument (and in no sense is the figure assumed to be proportionately accurate) we will take as varying from \$3.00 to \$4.00 per thousand of yield, the more the plant turns out per day, the less this charge per unit of product will be as far as this expense goes, the more product the better. This is such an obvious fact that even the most stupid of managers grasp it firmly and it becomes an accepted theory by

those who have no knowledge except the advice offered by such a manager. Now and then one of the more brainy men speaks openly as one has done in this case, and says that there is a point where the fact of turning out over a certain amount of product per day does increase the cost per thousand, so much that it is no longer profitable to run the mill at the increased rate.



DIFFERENTIAL MERCURY GAGE FOR DRYER PRESSURE.

To return to our figures, we have now left of our \$15.00 from \$6.00 to \$7.00 per thousand of yield that goes for supplies, repairs, wages, etc. These figures are made up of smaller sums paid in many directions, but one great truth covers all of them, and that is "when you overwork a man or a machine, you either produce an inferior product per unit of time or increase cost of product per unit of time." Overload

your boilers, your fuel cost goes up; overload your engines, your steam consumption per unit of power mounts skywards; increase the output of your beaters, the stock loses strength, and the quality deteriorates; give your man too much to look after, he must neglect to a certain extent some more or less vital detail.

So in the aggregate, as in the segregate, there is always a point of operation beyond which quality begins to deteriorate, and cost to increase far more rapidly than the value of the increased product. This point, on the curve of production, which is the point of maximum economy of a paper mill, is often far below the possible capacity of the paper machine or machines that, so to speak, in themselves epitomize the whole work of the mill in that they complete all of it. Sometimes the weakness of the support given to the paper machine by the mill is caused by the above hastily sketched causes only, and sometimes the boundary line between maximum economy and actual loss is abruptly crossed by the apparent necessity to use say more sulphite in the stuff in order to maintain a given speed on the machine, because the paper machine itself is inefficient.

When a mill is run say 20 per cent above its economical capacity, the deterioration of its machinery is rapid, and more immediately noticeable still, the labor, power and supply, and waste cost per thousand of yield advances rapidly; the \$6.00 to \$7.00 per thousand for these items soon becomes a \$10.00 to \$12.00 charge, and profits automatically disappear; the fact of this loss is often overlooked owing to old-fashioned book-keeping methods, is not always evident until it is too late to retrench and meanwhile contracts are made and obligations incurred that mean serious loss.

Two mills may be designed as practically duplicates by the same engineer, and yet the economical capacity per diem of one mill may exceed the other by 25 per cent; this point of maximum economical capacity depends on the machinery, layout, and personnel of the mill, and is within limits a very definite figure characteristic of each mill, and on the knowledge or ignorance of its value and existence may depend the commercial success of the mill.

To summarize conditions in a mill or in any mechanical operation, by stating it is not an economical thing to increase the efficiency of any machine in operation in that mill or operation, is to state the half truth that is more deadly than many absolute misstatements. It is evident that the strength of a chain is measured by the strength of the weakest link, but it is erroneous to throw away the stronger links because their extra strength is not needed; it is better to inquire carefully into the conditions of each link and try to strengthen all, until each is equal to the strongest, then the maximum work can be accomplished without extra strength being anywhere unused and unprofitable.

The obvious lesson we can draw from our thoughts on such a problem as this is that there are possibilities of economy in operation and production hidden in every mill and manufacturing establishment that will amply repay a properly organized effort to find them. This is one way to find them—(1) Ascertain the cost per unit of yield for every operation; (2) Compare the sum of the ascertained costs per unit of yield of all operations with the actual total cost; (3) Determine the leaks and losses; (4) Find an expression for efficiency for every operation, and try to improve this efficiency in each case; this is comparatively easy

when you have obtained a clear view of the cost of the component parts of each operation; (5) spend your money on the weak spots when you know them. The aggregate result of such a systematic investiga-

places; but no engine or machine can be good enough, efficient enough or fast enough, within mechanical and structural limits for some other conditions of service; it is always well to be sure that the engine

DATE		TIME		PAPER MACHINE TEST DATA				ENGINEER				FORM - 1	
NAME OF MACHINE OWNER -								LOCATION					
MAKE OF MACHINE				CONT. NO.				DRAWING NO.					
DESCRIPTION OF MACHINE -													
TEMPERATURE - OUTSIDE				KIND OF PAPER				FURNISH				% WATER AT FLOW BOX	
" - MACHINE ROOM				SPEED " " PER MIN.									
STEAM PRESSURE - EXHAUST													
" - LIVE STEAM													
ROLL	DIA. x FACE	SPEED PER MIN.	TEMP. DEG. F.	HYGR'TER HUMIDITY		% MOISTURE IN PAPER	WT. ON LEVER T'N'G. SIDE		WT. ON LEVER DRIV'G. SIDE		GENERAL REMARKS - such as Crowning-Pressure per in. face-Appearance of paper- Direction due to pressure conditions - Drawing.		
				WET	DRY		WT.	LEV. ARM	WT.	LEV. ARM			
BREAST													
U. COUCH													
L. COUCH													
U. 1 PRESS													
L. 1 PRESS													
U. 2 PRESS													
L. 2 PRESS													
U. 3 PRESS													
L. 3 PRESS													
SKC. PRESS													
1 DRYER													
VID. "													
LAST "													
CAL'D'RS.													

Form Used in Making Test on Paper Machine

tion is that the point of maximum economic capacity will soon catch up with the strongest unit of manufacture, even if that is a fast running machine.

In conclusion, it is well to note that any engine or machine may be too good, efficient or fast for some

or machine is designed for and is still in condition to faithfully perform the duty required of it, and every Tom, Dick and Harry cannot pass a reliable opinion in a matter of this importance; the problem should be carefully studied in every detail.

ASSESSMENT RAISED.

The Ontario and Minnesota Power Company has lost an appeal before the Ontario and Municipal Board. The fixed assessment for municipal purposes is \$25,000. When the town assessor, on the basis of the extensive waterpower and other holdings made a valuation of

\$637,642, the company appealed to the Court of Revision, which body raised the figure to \$1,000,000. The Provincial Board, on the appeal of the company held a direct investigation, and so far from reducing the assessment fixed it at \$1,280,000. There can be no appeal.

TECHNICAL EDUCATION IN PAPERMAKING

By T. LINSEY CROSSLEY

(Written Specially for Pulp and Paper Magazine)

The Canadian Paper Trade, whose future has seemed to be assured by considerations of cheap power and vast supplies of raw materials, now finds an element of added promise in the crippled condition of trade that will most certainly be found in European centres for a long time to come. While of course the last consideration is devoutly to be regretted, it presents us with a potentially great opportunity for expansion.

If there are "such things to be" we must be prepared not only with power, raw materials and capital but with workers to face intelligently the need for adding technical proficiency as a quality factor to the three quantity factors mentioned.

How can we make a rapid growth in proficiency to meet these conditions?

We had a Swedish foreman in the pulp mill who said "something must be done suddenly," when a twelve inch beam gave way under the chip bin. We cannot work quite so suddenly in technical education.

We can, however, realize that it is education—at least as much as induction that we are looking for. It would take at least a year under the most favorable conditions to open a school building and another three to five years before students could be trained and placed in mills and they would have practically no mill experience. In the suggestions that follow the main idea is that men now engaged in mills, co-operate for their mutual education.

For the last five years the writer has been endeavoring to arouse interest in some form of technical education for paper and pulp mill workers. He has approached pulp and paper mill men, technical schools and the Premier of this Province. The questions raised in these conversations could be grouped into three main propositions. First, what would be the composition of the student body in any proposed school of paper technology? Second what would be the nature of the instruction? Thirdly, how could such a project be financed and housed?

Taking up the first proposition: The classes of men who would be benefitted by knowledge of paper technology would be

- (1) Clerical or Commercial Managers,
Salesmen,
Purchasing Agents,
Stenographers.

It would be safe to say that many of the men acting in these capacities have not sufficient technical equipment. This is evident to any one who has corresponded with salesmen and managers with reference to such details as moisture tests or who has observed the handling of purchasing agents by skilled salesmen of supply houses, or dictated a letter containing the technical terms of the industry.

- (2) Supervisory or Constructive Superintendents,
Foremen,
Engineers,
Millwrights.

- (3) Practical or Operative Machine Tenders,
Beater Men,
Acid Plant Workers
Cooks,
Sizemen,
Bleachers,
Calendermen.
Cutters and Packers.

Now we come to the second proposition, the organization. It will be seen at once that the ideal practical school would need at least one specialist in each of the departments indicated by the above indications. Some way by which men in these various occupations could be co-ordinated into an efficient technical team for mutual supply and support would have to be devised for the curriculum of such a school. The beater-man should not put in time trying to grasp the details of salesmanship, but should appreciate the important relationship he bears to the sales department in a careful study of cause and effect.

The purchasing agent should know when and how to enlist the help of the chemist and he in turn should know, besides his analytical functions, something of engineering and of market conditions.

The third proposition as to financing and housing such a school was usually considered such a problem that the discussion terminated then and there. Manufacturers, rather short-sightedly said: "The government should pay" and the government, at least in one instance said: "The government will put up a share if the manufacturers make the first move."

It has been objected that such a school would only have a limited function in the training of men with a view to their taking up work in the paper industry. Men actually at work in mills, often in places a great distance from any other mills could not give the time or afford the money to go to a central school especially in a country such as Canada whose industries are not centered in any particular districts.

When the writer spoke of this question to Mr. J. R. Booth, his reply was brief, characteristic and contained the truth in a sentence, "The mill is the school for papermakers." This does not cut out the research idea of such places as the Canadian Forest Products Laboratory or the the magnificent work of the American Forest Products Laboratory at Madison. These places fulfill their functions however only under the eyes of skilled observers whose experiments must often be of a nature rather disturbing than helpful to pupils.

The writer believes that a means of carrying on some form of instruction can be evolved to include all the operatives of the pulp and paper industry and many of those whose business is more or less dependent on paper such as printers, lithographers, inkmakers, stationers, bookbinders, etc.

There are now three institutions in Canada that make an elastic educational arrangement possible. These are

- (1) The Canadian Pulp and Paper Magazine.
- (2) The Forest Products Laboratory.
- (3) The Canadian Pulp and Paper Association.

The idea would be, roughly, to form a sort of "clearing house" system of instruction with the Pulp and Paper Magazine as the medium, the Forest Products Laboratory as the reference library and the Pulp and Paper Association as the source of authority and financing agent.

It is suggested that the Magazine open a department of technical education and that students be enrolled at first by the act of subscription to the magazine. In many cases employers would be willing to pay this subscription for their men. The student being actually engaged in the commercial operation he is studying would have illustrations continually before him which could not be carried on in any school. His problems could be taken up with him by the instructor with comment by his fellow students.

The students would be enrolled and classified as of their various departments each department to constitute a class; from managers or superintendents down, and a student might be a member of several classes. For example a beaterman might be in classes for sizemaking and machine tending as well as beating. The text book of each class would consist of an edited reprint of the literature bearing on that special point. The students could place problems or their solutions of problems before their fellow students, so that each would get the benefit of all.

This may sound uncommercial to some manufacturers of the older school who do not believe in publicity, but team play is the watchword of today in industry. A wide open policy that leads to the increased consumption and wider use of a manufactured article is more scientific and for all concerned more profitable than the secret rule of thumb method. This often ties a large factory to the whims of an ignorant but fortunate operative who receives a big wage because he or his father has stumbled on some kink which now and then turns out an improved or increased yield. He doesn't know the reason and is helpless in the face of failure. These men talk knowingly of the "difference between theory and practice" and waste tons of material when some uncontrolled factor upsets their method.

A study of causes under proper control and by exchange of experience with others engaged in the same kind of work would soon standardize the special effort for the benefit of all and no one more benefitted than the deviser of any idea. An immense amount of more or less skilled observation is entirely lost by non-record of interesting occurrences in mills. The writer suggests that a start could be made by opening a department of technology in the Pulp and Paper Magazine to which questions arising in the various departments of mill work might be sent. These questions would be published and discussion invited for the next issue. In the meantime the instructor would also prepare a discussion of the points raised. In this way the experience of a man in British Columbia might help his fellow worker in Quebec. This work, properly attended to, would soon develop into a larger work. To give the work a start each mill could arrange to give a subscription to the Pulp and Paper Magazine to any of its men who would enroll as students and promise to undertake a reply to any questions that came into the class or classes in which he was enrolled. The mill could help by having his replies typewritten for him. If this work were taken up in the right spirit,

even by a few, it could not fail to place in scientific hands for filing, a lot of very valuable information besides leading the men away from their present isolation in unit mills to a broader conception of the industry they are engaged in.

We will suppose a man has joined a class. He would be given a number and filing card. His record card would read something like this:

No. 140	John Williamson, Oyster Bay Paper Co.
Beaterman	Attended school at Oyster Bay, Ont.
Bleacher	Started High School but only 1 year.
	School Record
	Submitted Problem No. 443—offered no solution.
Note—	Question—reasonable—well thought out.
	Answers received from Nos. 123—127—152.
	Answered Problem No. 592—submitted by No. 163
Note—	Answer showed correct ideas and good grasp of subject.
	Other communications—Numbers 408—524—712
Examinations —	Passed examination in Beating with high standing, but did not do as good work in examination on bleaching.

Such an institution would not need installation of expensive machinery with a staff of mechanics to run it and requiring large floor space. Instead, a desk, a typewriter, a good filing system and an instructor of practical and scientific experience would be all the equipment necessary for a long time and this could be extended very simply by additions of the same kind, more files, more typewriters.

If the industry as a whole responded in good numbers a very small fee would cover all the expenses.

Later an itinerary of lectures could be arranged so that the various students in any mill could meet and hear a lecture or series of lectures on the industry in general and discuss with the lecturer their own special work. The writer offers these suggestions in the hope that they may inspire action that will lead to a start being made with technical education in the paper and pulp industry of Canada.

TRADE INQUIRIES.

Upon quoting numbers below, Canadian manufacturers may obtain particulars regarding the following trade enquiries made to the Department of Trade and Commerce at Ottawa:—

1168. **Wood Pulp.**—A Glasgow firm desires the addresses of Canadian manufacturers of wood pulp who are in a position to quote for prompt shipment.

1170. **Papers.**—An English firm manufacturing cigarette papers, bible papers, copying, manifolds and typewriting papers, wishes to get into touch with Canadian importers.

1190. **Pulpwood Poles.**—A Welsh manufacturing company invites quotations from Canadian firms who can supply pulpwood poles (4 in. to 12 in. top and in lengths of 9 to 12 feet barked and partly basted), suitable for conversion into wood fibre for packing purposes.

1199. **Paper.**—A London firm who are buyers of various kinds of paper, and especially of news, invites offers from Canadian manufacturers.

LEDGER AND ACCOUNT BOOK PAPERS

By HARRY A. MADDOX

(Written Specially for Pulp and Paper Magazine)

Ledger paper ranks among the most important products of the papermaker and the case of the finest grades represents one of the most remarkable achievements in the world of paper. The importance of the stock makes it necessary to devote persistent consideration to the principles which must always guide its manufacture. To this end, therefore, the following matter will purport.

The essential factors are, durability of material and physical character, the latter including ink resistance, erasure, surface colour, strength, finish, etc. Sundry other features of only slightly less importance are the watermark, sorting, counting, packing, etc.

The development of loose leaf ledger systems has created a distinct incentive for new ideas in papermaking, mainly in the direction of strength, colour, texture and character of wiremark. It has become realized more and more that strength to an extreme degree, combined with the maximum of durability, is an absolutely essential feature in ledger paper of grade number one. Formerly, almost every type of ledger paper was run under a laid dandy, a matter for which no efficient reason can be assigned. Wove papers are more suitable in every way for ledger stock and it may be desirable to devote a little consideration to this phase of our subject. In the first place, wove texture presents an improved appearance; it also introduces an equally distributed and improved strength by reason of the absence of the thin ridges which are characteristic of the laid mark. The laid wire dandy imparts what is really a watermark, consisting of thinned and thickened portions in the paper. In testing a paper for strength it is an axiom that watermark portions must be avoided, but on a laid paper it is manifestly impossible to avoid the markings. The maximum of strength from the same stuff is secured by running the wove dandy. Continuing further, it may be claimed that the surface of wove paper presents a more even and responsive pen-writing area than if it were undulating with laid marks. Certainly it presents a much better opportunity for unbroken ruling and printing, as any practical stationer will readily admit. Add to this that the wove dandy closes the web better, thus enabling a closer texture to be obtained, and it would appear that we have sufficient even for a further development in the use of the wove dandy on ledger and account book stock.

Watermarking is a branch of the art of papermaking which has not received sufficient attention from a common sense point of view. Massive marks, embodying incongruous devices and lettering of unwieldy proportions, have almost become established, to the detriment of the paper itself. It is perhaps advisable under these conditions to consider the true purpose of a watermark. In the first place it is a brand of quality, secondly it is an advertising agent whose purpose is to secure repeat and enhanced orders for the same quality. Certain types of standard watermark are applied to the several sizes of account book paper as a derivation from old customs. Although this habit is on the wane, it is still largely practised, particularly on English papers. In a sense the marks are useful, but not sufficiently so to counteract their

disadvantages. To the papermaker or the user of the ultimate book they are of no earthly use or value, while if the stationer knows his business there is no necessity to point out the size of a sheet by means of an incongruous traditional service. The present position of the watermark, with few exceptions, is the centre of the sheets. In our opinion that position is ugly and useless; further it is a distinct hindrance to the paper-ruler, while the argument may also be put forward that it weakens the sheet to an appreciable extent. A watermark will serve its purpose equally well, better in fact by being small, certainly also, it will aid toward uniformity and beauty in the sheet. The first essential then, toward successful and up-to-date watermarking is that the device, or name, or both, should be small. At the same time, it should also be distinct, preferably of the fine outline variety. Having attained the desired diminution in size, we may next proceed to a perusal of position. The worst place for a watermark is along the middle of the sheet, yet as we have already observed that is precisely where most of them appear. A short examination of the watermarks in written up account books, or in printed volumes will conclusively prove the extreme difficulty which attends the effort to decipher a large watermark in this position. All ruled and printed books have a wider margin of blank space at the foot than elsewhere. This in itself points the way to correct opposition of the watermark. It may run twice along the foot in order to fall on every leaf or folio. The small amount of trimming which accompanies the manufacture of standard size account books could be readily allowed for. Coincident with this approved position of the mark, the work of the ruler and printer is aided considerably and better results are ensured. A deeply impressed device in the middle of a sheet will hopelessly break up the contour of either a fine ruled or printed line. It should be borne in mind by the papermaker that the ruler's pens ride very delicately over the surface of the sheets, therefore at every depression a broken line is inevitable.

While on the subject of watermarks a word or two may profitably be said concerning wiremarks. These refer to the wirepores so common on the underside of both wove and laid machine papers. At all costs these should be eliminated on high grade ledger stock. It is a common complaint of the ledger clerk that he encounters considerable difficulty in writing on the wrong side of the paper. It is vastly annoying, after running smoothly over a full page to turn over leaf and engage a page exhibiting a distinctly different character to the first. Much may be done during manufacture to eliminate wire pores. In the first place the pulp should be well beaten; then avoid an unduly severe wire shake at the wet-end. Work a suction couch roll if possible, or at least control the style of jacket and amount of pressure to reduce the danger of maintaining a wiremark. The web must not bear any trace of the wire pattern after passing the press rolls, for little help can be expected at the finishing end, in fact the damping and tub-sizing are more likely to open out the mesh than otherwise. Naturally, we do not expect nor desire to remove the appear-

ance of a woven wire so far as the look-through of the paper is concerned, our remarks apply merely to the porous state of the wireside of many makes of ledger paper.

The question of even-sidedness in color is vitally combined with the foregoing proposition of eliminating wire-marks, for the treatment that rids the latter perfects the former. In the control of color in ledger stock, among others, two things need to be considered, the specific gravity of the color and the influence of suction on the web. Smalts is a notably heavy mineral color, with ultramarine a distant second. Papers dyed with smalts are notable for the dark color of the underside, particularly in the case of hand-mades. There is neither use nor beauty in a ledger paper which approximates to a duplex tinted in the matter of coloring. As far as possible this effect must be overcome. Much may be done by using well beaten pulp, which settles slowly on the wire and retains the color well on the surface. At the same time it is of no use to employ correctly beaten stuff unless it is kept well mixed in the stuff-chest, and en route for machine. A good mixing device which will keep the particles of colors in adequate suspension is a necessity where smalts and ultramarine constitute the dye. At the wire, the water must be allowed to carry on for a sufficient distance in order to impart strength and a slow and steady settling. The suction rolls and pumps must work lightly to accommodate this process, as a big pull at the suction boxes irretrievably sets the wire mark and draws the color to the underside.

With the attainment of even-sidedness in coloring, there still remains much to be said. The type of dyestuff used for toning any particular grade of azure or blue stock is an item of information usually known only to the papermaker himself or the chemist who decides to make an analysis. It would be a decided advantage to the stationery trade and to particular users, if the grade or type of dyestuff were devoted on the stock wrapper or on the sample sets. It is often important that paper for certain purposes must be dyed with a material immune from attack. For example, paper for permanent record journals, which would require to be stored or used in an acid atmosphere would not be satisfactory if dyed with second-rate ultramarine. Under present conditions, neither the stationer nor his client is aware of the nature of the dye with which the stock is colored. As a consequence, it is only when the damage is done that the importance of determining the dye is recognized. Some rules should be defined by papermakers and buyers with a view to setting down regulating standards for ledger papers.

We would suggest that for grade I., papers suitable for permanent records, state documents and forms, books, etc., and for blued stock that must be fast to every likely atmospheric reagent, smalts alone should be used and that only of the best quality. Every precaution should be taken to prevent a speckled appearance due to the many gritty and over-sized particles characteristic of poor grades of smalts.

For grade II., books of secondary importance and those not likely to encounter severe fumes, an almost permanent coloring would be ensured by using a mixture of smalts and good ultramarine of good quality.

For grade III., where absolute fastness may be subservient to brilliance of tone, pure ultramarine alone will provide everything desirable. Such a paper should be absolutely free from acid traces and contain but the

minimum of alum, whether from the preliminary resin or ultimate tub size.

Smalts, is an unfading blue of low tinting power and embodies in its composition silica, potassium and cobalt glass, or chemically as a potassic cobalt silicate. Smalts may embody up to 67 per cent of silica, whereas ultramarine does not hold above 42 per cent in the best grades.

Ultramarine is a double silicate of aluminium and sodium, together with bisulphide of sodium. The best grades are rich in silica and the value of the color for fastness may be judged partly by this content. During manufacture, and especially at the drying end, ultramarine is submissive to the effect of alum embodied in the pulp, but the interaction practically ceases when the paper is closely packed and not exposed to light, heat or damp, provided that there is not present a considerable excess of alum or acidity. In the drying process, air or loft drying methods provide much less likelihood of deterioration in color, a disaster which is often due to sudden and strong heating at the cylinders.

To briefly restate the case, smalts should be used for highest grades of permanent ledger paper as also for important records in chemical manufactories, and other places where fumes are prevalent. Ultramarine would soon display its susceptibility to acid fumes and would in time totally disappear. The reasoning of permanent color applies with equal force to the choice of ruling, printing and writing inks, perhaps even more vitally than to the paper dyestuff, for bleaching or fading of the latter would not be likely to affect the written or printed record. It may be presumed, however, that the effect of the action carried on in situ during the progress of color deterioration might influence the character of the paper itself in some degree.

Where there is no probability of destructive chemical influence on the paper, as in professional offices, ultramarine or indanthrene coloring would be efficient, but the former is preferable by virtue of the purer tone of color imparted.

There is much more to be said on the subject of ledger paper, but sufficient space has been taken for the time. We hope to devote further consideration very shortly.

QUANTITATIVE DETERMINATION OF ROSIN IN PAPER.

(Special translation from "Papirjournalin.")

Five grams of paper, cut in strips of 1 to 4.5 centimetres, one folded and extracted in a Saxhlets apparatus on water bath with an acid alcoholic liquor, consisting of 100 cc. alcohol (95 per cent) + 15 cc. water, which contains 5 cc. glacial acetic acid in every 100 cc. The liquor is run over 6 to 12 times, depending upon the quality of the paper, and afterward evaporated in a beater, until only a few cc. remain. After cooling 25 cc. ether are added and the liquor is shaken in a 300 cc. separating funnel with 150 cc. water, containing a little NaCl to prevent the formation of an emulsion from the size contained in the paper; the ether is separated off and the liquor remaining again shaken out with 25 cc. ether. The two ether extracts are mixed and washed twice by shaking with distilled water in order to eliminate any salts, if present, as well as other substances. The ether solution is evaporated to dryness in a platinum dish and is then left for exactly one hour in water drying box at 98 deg.—100 deg. C. and weighed.

ONTARIO WORKMAN'S COMPENSATION ACT

An Impartial Analysis.

By N. A. KEYS, B.A.

It bears no small testimony to the interest which this subject has evoked, and is evoking, that you, tired after your day's work in the shop, are willing to be here in such large numbers to participate in a discussion of the new Ontario Workmen's Compensation Act. This Act is probably the most important legislation which the Ontario Government has ever enacted. The subject of workmen's compensation is an unusually difficult one involving as it does, social, economic, legal and actuarial technicalities. One who has given the subject much study, therefore, is very apt to lose sight of the forest in the examination of the trees. I must ask your indulgence if I should infringe in this respect.

Workmen's compensation may be defined as the method of paying insurance to workmen for accidents which occur to them in the course of their industrial employment. In dealing with the subject it will be my endeavor, first, to review briefly the present law, secondly to explain the essential features of the new Workmen's Compensation Act, particularly those which are of significance to you, thirdly to deal briefly with the question of accident prevention, a question which is just as important, if not more so, than the compensation of workmen itself.

Damages Under the Old Law.

At common law a workman is only entitled to receive damages from his employer if he can prove that the latter was negligent. In the course of time the employer became possessed of three defences which cut down very materially the workman's chances of securing a verdict. The first of these was that of contributory negligence; a second defence was that of common employment. The employer, if he could prove that Tom Jones had been injured through John Brown, a fellow servant, was entitled to receive a verdict in his favor. A third defence which is very vague of definition, and left open the door very wide for a clever lawyer, was that of inherent risk. In this defence the employer put in the plea that the accident was due entirely to an inherent risk in his industry, a risk of which the workman was aware when he entered the employer's employ. Well, under this state of the law the workman, as you can readily see, would recover damages in very few cases. I think the actual percentage of cases in which a workman did receive a verdict in his favor was about sixteen per cent.

The large growth of the population in recent years, the rapid march of invention and the vast organization of industry has rendered some more equitable method of compensating workmen imperative.

This former system of compensating workmen was enormously wasteful. Statistics show that of every dollar the workman paid in insurance only 25 cents ultimately reached the pocket of the injured workman. About thirty cents of this would be absorbed by insur-

ance agents, another 20 cents would be used up by the insurance company in overhead expenses and the other 25 cents would be eaten up in meeting the fees of lawyers. The problem of workmen's compensation then was to substitute for this wasteful and inefficient method of indemnifying workmen an economic and efficient method which would ensure every workman who received injury in the course of his employment without his negligence, receiving a fair and adequate compensation.

Settling Claims Under German Law.

In most countries the problem was approached by way of removing one by one the common law defences of employers. This method of attacking the problem, however, was only partially successful. The insurance agent and the legal adviser continued to play the game as before and just as extravagantly. While more verdicts were recovered than formerly, a large proportion of industrial accidents still remained uncompensated. In one country only, that of Germany, was the problem dealt with in a thoroughly scientific way. The Germans, as you know, are the most scientific people in the world. Well, in that country they decided to eliminate the insurance agent and the legal adviser. Accident claims were automatically paid out of funds to which workmen, employers and the State contributed. These funds are controlled by the State. Claims are settled by arbitration boards of employers, workmen and Government appointees. Such a system has one great advantage which is entirely lacking in all other systems—it enables the payment of compensation on a periodical, instead of a lump sum, basis. In other words, it introduces the pension system. Now there are workmen who would rather receive \$1,500 at once than \$3,000 say, spread over ten years, on the principle, I suppose, that a bird in the hand is worth two in the bush. But this principle so far as compensation is concerned is a dangerous one, for the reason that few of us know how to look after our own money—most of us are far more competent to deal with and look after the money of other people. Hence when a workman receives an accident award of \$1,500, he finds himself grown extremely popular over night. Numerous friends suggest numerous ways in which they can duplicate and triplicate his capital in a marvellously short time. The inevitable result, of course, is that the money which is meant to furnish relief is lost either in speculation or dissipated in a blow-out in a very short period and the workman is then in want.

Under the pension system a workman only handles his monthly or weekly pension as the case may be, and rash investment or dissipation is rendered impossible.

In Ontario, the German system above briefly outlined was to a certain extent followed drafting the Act.

Divisions of Employers.

In turning to an examination of the Ontario Workmen's Compensation Act, I am reminded of the story of the Scotchman who drank a queer mixture every night before going to bed. This mixture consisted of

(Address delivered before a meeting of the managers and foremen of the Canadian General Electric Co., at Oshawa, Ont.)

whiskey and beer in equal proportions. When asked by an inquisitive friend why he did this he said: "Whenever I drink whiskey alone I get drunk without getting full; whenever I drink beer I get full without getting drunk, and as I wish to get drunk and full both at the same time I mix my drinks." Well, my case is the reverse of that of the Scotchman in this story. The Act has some very fine whiskey in it and a large amount of very weak beer. I shall endeavor to extract the whiskey. The Act proposes to deal with three large divisions of employers in three different ways: Employers coming in division (1) which, roughly speaking, applies to all manufacturing industries, are compelled to insure their employees in a provincial insurance fund. Accident claims are submitted to, and decided by, a provincial insurance Board.

Division number 2, is applicable to certain corporations such as railways, telephone companies, telegraph companies and certain classes of navigation. Such employers insure their own workmen but the claims are passed upon by the aforesaid Board.

Division number 3 is a residuary division applicable to all employers such as farmers, professional men, etc., who do not come under the first two divisions. Employers in this division remain liable to a common law action by their injured workmen with their defences removed.

We are concerned with division number 1. All the larger manufacturers of the country are to be grouped into classes, assessed premiums and subjected to the supervision of a provincial insurance Board for workmen's compensation purposes. This Board is to consist of three members or Commissioners who will be quartered in the Parliament Buildings in Queen's Park at Toronto. This Board will assess, levy and collect premiums from individual employers according to the class and hazard of their industry. With the premiums which they collect an accident fund will be formed out of which all workmen in the insured industries will be automatically compensated.

Who are workmen under the Act? Every person engaged in industrial employment and subject to the hazards of the industry is deemed a workman. Two large classes of employees only are excepted, namely, casuals, or those who do piecework in their own homes, and such of the clerical staff who are not ordinarily subject to the dangers of the industry.

What injuries are compensated? All injuries by accidents arising out of and in the course of the workman's employment are to be compensated, provided that they last for seven days. If an injury last for less than seven days no compensation will be given to the workman. If it lasts for more than seven days the compensation reverts back to the time of the occurrence of the accident, that is, it is paid from the first day.

Who are dependents under the Act? The following are dependents—wife, husband, father, mother, grandfather, grandmother, stepfather, stepmother, son, daughter, grandson, grand-daughter, stepson, step-daughter, brother, sister, half-brother, half-sister and those who stood in relation of parent to the injured workman or to whom the injured workman stood in relation of parent.

You see that the Act is very broad and far-reaching, covering practically all workmen, extending to all industrial accidents and making provision for all dependents.

The Schedule of Benefits.

We come now to the schedule of benefits, or scale of compensation to which a workman or his dependents is entitled in case of an industrial accident. I shall first deal with the death benefits. If a workman is killed while engaged in industrial employment his dependents are to receive expenses of his burial up to \$75. His widow will receive a pension of \$20 per month for life, or \$240 a year. His widow, if there are children, will receive in addition \$5 per month for each child up to a maximum of \$20 so that the total compensation received by a widow with four or more children will be \$40 per month or \$480 per year. If the children are rendered orphans by the accident they will receive \$10 each per month as a pension, but not more than a maximum of \$40 per month. If the workman at the time of his death was under 21 years of age his parents, if dependent on him, are entitled to receive compensation of \$20 per month until such time as the deceased workman would have attained the age of 21 years. If there are other dependents they shall receive compensation not more than \$40 per month only so long as their dependency would have endured. If a widow in receipt of a pension should marry she would cease to be a beneficiary on the pension fund, but would receive a marriage settlement of two years' pensions, or \$480. Children cease to obtain pensions when they attain the age of sixteen years.

It may be of interest to note just what amounts this pension will reach in certain periods of time. A pension to a widow of \$20 per month would in ten years reach the total sum of \$2,400, in twenty years \$4,800, in thirty years \$7,200, in forty years \$9,600 and in fifty years the large amount of \$12,000. In Washington for a smaller scale of benefits than in Ontario they have estimated that the average maximum will be \$4,000. The average in this province, therefore, would be somewhat higher. These then are the death benefits.

Permanent or Partial Disability.

Let us now examine the benefits which a workman who is seriously injured will receive. These benefits depend on the amount of the earnings. If a workman receive what is known as a permanent total disability, as for instance, the loss of both legs, he would receive a pension equivalent to 55 per cent. of his annual earnings of the rest of his life, but his earnings must not be calculated on a larger sum than \$2,000. A workman meeting with a permanent partial disability, such as the loss of a hand, is to receive a pension equal to 55 per cent of the impairment of his earnings capacity. In other words, if a workman earning \$20 per week loses his hand and upon returning to work finds that he can only earn \$10 per week he would be entitled to a pension corresponding to 55 per cent of the impairment, that is \$5.50 per week. Temporary total disability, such as a sprained back, is also compensated on 55 per cent of the impairment basis. Accidents which result in temporary partial disability, shall receive no compensation unless the impairment is more than 10 per cent of the earning capacity.

What exactly does a serious injury to a workman mean to the employer, or rather group of employers? If the workman should be in receipt of a salary of \$2,000 or more and met with a total disability accident he would receive as a pension \$1,100 a year. Total pensions would accumulate in ten years to \$11,000, twenty years \$22,000, thirty years \$33,000, forty years \$44,000 and fifty years \$55,000.

Another feature of the Act which is of considerable importance to you is the procedure to which you have to conform when an accident has occurred in your shop. A return has to be made by the employer of the accident, notifying the Board by registered post of the accident. This report should contain the following information: First, the nature of the accident; second, the time of its occurrence; third, the name and address of the workman; fourth, the place where the accident happened, and fifth, the name and address of the physician or surgeon (if any) by whom the workman was or is attended. The responsibility of submitting these returns will very largely devolve upon you as representing your employer. The penalty for failure to observe this regulation is \$50.

We come now to the third and last branch of our subject, namely, that of accident prevention. In former times when employer, workman and apprentice worked side by side in the same little shop it was possible for an employer to exercise such minute and careful supervision over his fellow-workmen that accidents were few and far between. Such as did occur were attended to as a rule by the employer himself. Under modern conditions where organization and centralization are ever on the increase, an intimate relationship between employer and employee is impossible. This in itself is perhaps unfortunate. Employers, however, still have that wide and humanitarian interest in their workmen which makes them feel acutely any misfortune which befalls one of their employees, even though that employee be not personally known to him. You as foremen now take the place and act in the stead of the employer. It is you who are, and will be made responsible for the number of accidents which occur in your part of the shop.

Of late we have been hearing a good deal of the "Safety First" movement. Of this movement you are going to hear more and more from now on. It is one of the healthiest movements of the times. The annual accident roll of industries when examined in statistics is simply appalling. In the United States of America, which has a population roughly speaking of some 100,000,000 inhabitants, there are every year 35,000 persons killed in industries, or one person every fifteen minutes. There are also 2,000,000 injured, or one person every sixteen seconds. No further comment is required to show the tremendous need for preventing these accidents—and they can be prevented. Certain firms who have specialized in accident prevention have cut their accident rate in half in one, two and three years. And this has been done not by the employer alone. True, he furnishes the safeguards and printed danger notices, but the real work is done by the workman and foreman. The unthinking person is only too apt to believe that accidents are all due to the hazard of the industry. This is not so. German statistics, and I may say these statistics are compiled by employers, workmen and arbitrators in collaboration, prove that only 43 per cent of all industrial accidents are due to the hazard of the industry; 29 2-3 per cent are the result of carelessness on the part of the workman; 18 1-3 per cent are due to the employer's fault, and the remaining 10 per cent are caused by workman and employer together. From these figures you can deduce the possibilities of checking the accident rate.

You, holding positions of responsibility in one of the largest plants in this country have a splendid opportunity of doing a humane work. By exercising that personal control over your men which was formerly

exercised by the employer himself, by never failing to instill in your men the "safety first" habit, by constantly pointing out the foolishness of taking chances—a habit which is only too strongly embedded in our national life—you have indeed a rare opportunity of showing an example not only to plants similar to yours, but to the other plants of this province.

The Companies Case Decision

The Canadian Manufacturers' Association has issued the following circular on the subject of the recent Privy Council decision on the Companies Case, by which it was declared that a company holding a Dominion charter was privileged to carry on business in any province without relicensing; as follows:—

"The decision rendered a few days ago by the Privy Council in the case of the John Deere Plow Co. v. Wharton marks the successful conclusion of five years' effort on the part of the Legislation Committee of the Association to secure a solution of a number of difficult questions surrounding the incorporation and licensing of companies. Ever since Confederation both the Dominion and the provinces have incorporated companies but there has always been grave doubt as to their respective jurisdiction. There was doubt whether a provincial company was competent, under any circumstances, to carry on business outside the incorporating province. There was no doubt that a Dominion company was competent to carry on business in every province but the question was whether such a company should be compelled to comply with the provincial laws requiring it practically to become re-incorporated in every province in which it sought to carry on business.

The Privy Council in the John Deere case has answered this last question in the negative. As a result it will now be recognized that a Dominion company has, and always did have, power to carry on business in every province without becoming licensed or registered under these provincial Acts.

"The Act of the Province of Quebec specifically excepts Dominion companies but companies incorporated in other provinces and other countries are required to become licensed in Quebec as in the other provinces.

"It results obviously from the decision in the John Deere case that a Dominion company is in a better position than a provincial company. The question whether provincial companies should abandon their provincial charters and take out Dominion charters must be determined largely with reference to the circumstances of individual companies, their methods of carrying on business, etc. Members of the Association who are in doubt as to their position in any of the provinces should consult freely with the Legal Department which is fully equipped to advise or undertake any work in connection with the subject."

DYESTUFFS STILL COMING.

The American tank steamer Sun, bound from Rotterdam for New York, with a cargo of dyes valued at \$3,000,000 arrived recently in Boston.

After being supplied with coal and water, the steamer sailed for New York. This shipment of dyestuffs is one of seven which has been contracted for, this being the second to leave Rotterdam for this country since November 1.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

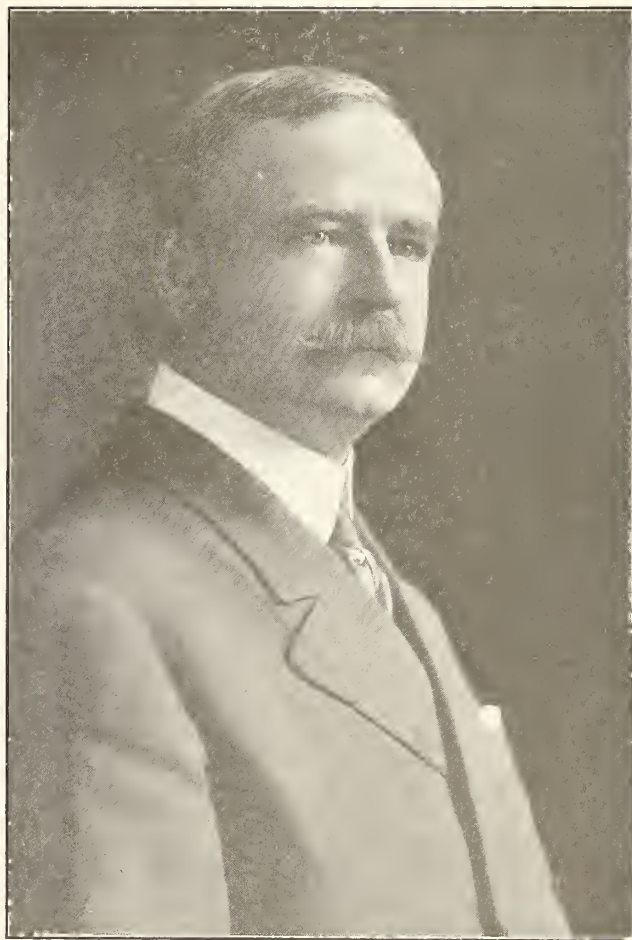
WILLIAM P. RYRIE, Managing Director of Becker & Co., of America, Limited.

One of the hardest men to catch in his office is William P. Ryrie, of Toronto. He is on a trip to Europe, down in the Eastern States, flying across the continent, or in some other remote part. But he is not neglecting business, for his jaunts are not of a holiday character. He is either getting information in regard to market conditions, studying shipments and demands or selling pulp, as he does by the thousands of tons every year, obtaining supplies from nearly every country in Europe. No man is more conversant than he with the foreign situation. As Managing Director of Becker and Co., of America, Limited, he carries on extensive operations in the United States, for the reason that the market in Canada is very much restricted owing to the imposition of a Canadian tariff duty of twenty-five per cent. As is well known all foreign pulp enters the United States duty free. While this condition militates against a large foreign trade being done in the Dominion, Mr. Ryrie expresses himself quite content that our own market should be supplied from local sources as this is a direct encouragement to Canadian enterprise and industry.

About sixteen years ago when on a visit to the Old Country, Mr. Ryrie had the pleasure of meeting F. E. R. Becker, head of the firm of Becker and Co., Limited, the largest importers of wood pulp in the United Kingdom, who in spite of the heavy proportion of imports cleared by their customers last year, headed the list with 230,938 tons of wood pulp, which exceeded the total amount cleared by all their competitors by 115,171 tons. This world-wide known concern import mechanical and chemical pulp from practically every country on the globe, and are the selling representatives of the largest pulp mill in the province of Quebec as well as several in Nova Scotia. For some years Mr. Ryrie acted for the company in a consulting capacity regarding conditions in America, being given a liberal retainer for his services, but gradually this connection became more intimate, and the alliance broadened. The outcome was that three years ago the firm of Becker & Co. of America, Limited, was formed with Mr. Ryrie as Managing Director, to carry on the trading of the company on this side of the Atlantic. The company are selling agents for many mills as well as traders or merchants buying the pulp outright and disposing of it to the largest consumers in Uncle Sam's domain. Previous to the outbreak of the war, supplies were purchased in Sweden, Norway, Finland, Germany, Russia, Austria and Roumania, but now the sources are largely confined to Scandinavia and, while the head offices of the company are in Toronto, shipments are landed principally at Boston, New York, and other Atlantic ports.

With the exception of a few years spent in Montreal, Mr. Ryrie has always lived in Toronto and finds the city a central and convenient point to carry on his extensive operations. His father, who was born in Scotland, came to Canada in 1843 and located in Toronto where he carried on a large contracting and building business. Of the three sons, James, William and Harry, all have taken a prominent part in the

business life of the city, James and Harry being the members of the firm of Ryrie Bros., Limited, the celebrated diamond merchants and jewellers. William was educated at the public and Grammar schools, and his first association with the paper trade was in the early days of Barber and Ellis, Limited, back in the late seventies. He was a pioneer traveller for them when they succeeded the firm of A. Dredge and Co. His next connection was with William Warwick (now of Warwick Bros. and Rutter), where he remained for a few years as head of the stationery department. In 1882 he went to Montreal and linked up with the his-



toric paper house of Alex. Buntin and Co. After some years spent in representing them as far west as Winnipeg, he started business on his own account in Canada's commercial metropolis. Returning to Toronto in 1894, he formed the Ryrie Paper Co., opening a warehouse on Bay Street, where he handled all kinds of foreign papers—bond, book, ledger, litho, engraving, gum, art, etc. After five or six years he discovered there was more money in acting as a selling representative and letting the mills carry or supply the stock, and until the spring of 1911 he acted in that capacity.

Then came his strong alliance with Becker and Co., Limited, of London, England, as already outlined.

Outside of business life, the chief hobby of Mr. Ryrie, who is one of the most genial, kindly and courteous gentlemen identified with the trade, is Masonry, in which he has held many responsible offices and has attained the rank of thirty-third degree in the Scottish Rite. He was elected to the exalted and important position of Supreme Grand Master of the Knight Templar Body in Canada for two years, 1911-1912. An active member of the Board of Trade, a leading figure in the National Club of which he has been a director for several years, President of the Old Boys' Association of the Toronto Grammar School, and an ardent devotee of water pastimes, being associated with the Royal Canadian Yacht Club, he has also taken a deep and quiet interest in charitable work of all kinds. Whether in business negotiations or social intercourse Mr. Ryrie can count his friends by the score, not only in his native city, but among the trade throughout the country, and so far as known has only one outstanding frailty—he is a bachelor. He has never been diffident regarding any worth-while proposition except matrimony—and the only reason his conferees can assign for his not making a venture in this direction, is that he still considers himself too young to accept such responsibilities as would necessarily be incurred.

Ottawa Notes

Ottawa, Ont., November 10.—The Supreme Court of Canada, at its sitting here a week ago had before it two cases of interest to the lumber and paper trade, and both of which hinge on leases of Crown lands obtained from the Government. One was that of Booth vs. the King, and the other the Vancouver Lumber Company vs. the King. Judgment was reserved in both cases.

The case of Booth vs. the King concerns a license obtained by Mr. J. R. Booth from the Superintendent of Indian Affairs to cut timber and pulpwood on certain Indian lands. The license was renewed each year until the year 1909 when the Indian department refused to renew it. Under the Indian act the superintendent could grant licenses to cut timber on Indian lands, and though such license was not to be for longer than a year an Order-in-Council passed in 1888 provided that a licensee who had paid all dues and complied with other conditions of his license could renew his license on making application. On the refusal of renewal to Mr. Booth the question arose as to whether he had an absolute right to renewal or if it were always within the discretion of the Crown. The Exchequer Court took the latter view and hence Mr. Booth's appeal.

The case of the Vancouver Lumber Company vs. the King concerned the leasing by the Dominion Government in 1899 through the Minister of Militia under authority of an Order-in-Council, of Deadman's Island, Vancouver, which is a valuable timbered property. The lease was for twenty-five years renewable and provided that either party could terminate it by notice and that the Crown could terminate by demand for possession if it should be necessary for military purposes. In 1890 the Minister of Militia, without any further Order-in-Council, amended the license by executing an indenture which amended these conditions and provided for

the renewal of the lease for twenty-five more years after it expired. The Crown claims the last indenture was executed without authority and asks to have it cancelled. Such cancellation was granted by the Exchequer Court and hence the appeal.

Water conditions in the Ottawa River have improved somewhat of late. This is due partly to the fact that all the lumber mills on the stream have closed down and partly to recent heavy rains which have raised its level somewhat. As a result pulp and paper firms in this district are operating with somewhat less difficulty than has been the case for months past. The J. R. Booth Company reports that it is now able to manufacture its own pulp again and as a result its heavy purchases from the Abitibi Pulp and Paper Company have almost ceased.

British trade returns for October, which have just been received by the Trade and Commerce Department, indicate that Canadian manufacturers are shipping greatly increased quantities of pulp to the United Kingdom. During this month the Canadian export was 26,037 tons of mechanical wet pulp as against 5,151 in October of 1913. The Canadian trade agent at Manchester also reports that out of 106,000 bales of wood pulp which have reached that port within a few weeks, shipments of 40,000 bales each were of pulp from Chicomini.

That section of the National Transcontinental from Cochrane to Superior Junction is to be operated this winter though whether by the Government is not definitely known. Reports which have reached the Department of Railways and Canals are to the effect that there is an enormous quantity of pulpwood already cut and stacked along the line from which the line expects to draw its chief traffic.

FELT MANUFACTURERS LOSE SECRETARY.

(Special to Pulp and Paper Magazine.)

New York, N.Y., December 10, 1914.

At a meeting of the Felt Manufacturers' Association held at Buffalo, N.Y., on Thursday, December 3, the resignation of John C. Collins as secretary and treasurer of the organization was accepted. Mr. Collins has accepted an offer for a bigger position in another field. In offering his resignation Mr. Collins said that it was with reluctance that he was giving up, as his "heart and soul were wrapped up in the work." Every member of the association regretted to see Mr. Collins leave the body for which he has done so much good.

The regular election of officers for the coming year does not take place until January, but it is probable that A. A. Price, who has been inspector for the association during the past year, will be honored with the secretaryship. Mr. Price is familiar with all the needs and duties incumbent upon the office and will no doubt be chosen as Mr. Collins' successor at the meeting next month.

It was also decided that Buffalo was a more central point for the headquarters of the association than Cincinnati, and consequently the members decided to move the executive offices from their present location in the Central Building at Cincinnati, Ohio, to Buffalo, next year. The annual meeting will be held in Buffalo on January 7.

The meeting was well attended and the members were enthusiastic over the success of the work undertaken and accomplished since the organization was formed last February.

NEW PATENTS

Paper making machine, patented in United States Patent Office, November 24th, 1914, by Chester Allen Mellinger, Herman Reed Harrigan, Benjamin Denver Coppage, Harvey Greenleaf McDowell and John Warren Vedder, of Wilmington, and Christopher John Strobel, of Elsmere, Delaware, assignors to the Pusey and Jones Company, of Wilmington, Delaware.

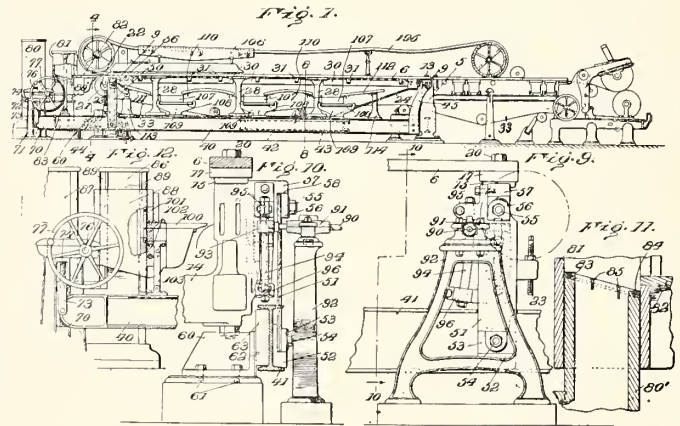
The inventors say:—This invention relates to the Fourdrinier part of paper making machines, and particularly to the type of machines in which provision is made for a considerable vertical adjustment of the forward or outer end of the Fourdrinier part to tilt the same to different angles with relation to the horizontal, the desire as to the exact angle of tilt varying with different paper manufacturers.

The objects generally and principally are to provide a rigid adjustable base frame or beams, upon which the shake frame or section is mounted to be laterally vibrated or shaken without also shaking said base-frame and other parts (such as the save-alls and associated roofs) which do not require shaking to provide a structure in which the save-alls and their associated roofs are mounted on said base-frame, so that they participate in the vertical adjustment and therefore do not interfere with and restrict a considerable adjustment to provide such a structure in which the entire base-frame, as well as the shake frame, more particularly the rails thereof, and other parts mounted on said base-frame, pivot about a single common axis in and vertical tilting adjustment of said parts, thereby avoiding strains and stress upon joints; to provide a connection between the shake-frame and the means for vibrating the same that will afford a range of adjustment commensurate with the considerable vertical adjustment of which the forward end of the Fourdrinier part is susceptible; and to automatically adjust the height of the apron of the flow-box through connections to the forward end of the base frame. These and other objects apparent from the detailed description are accomplished by the structure of this invention, a preferred embodiment of which is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation showing particularly the Fourdrinier part of the machine; Fig. 2 is a side elevation of the shake-frame of the Fourdrinier part of the machine; Fig. 3 is a plan view of the base-frame composed of two side beams and cross-bracing, and of the adjusting means for tilting the same; Fig. 4 is an elevation looking toward the right on line 4—4 of Fig. 1, with the breast roll and some of the other parts omitted; Fig. 5 is a sectional view on line 5—5 of Fig. 4, some of the parts shown in Fig. 4 being omitted for clearness; Fig. 6 is a vertical sectional view of the pivotal support at one side of the inner or rearward end of the base-frame and the shaking section; Fig. 7 is a side elevation of the parts shown in Fig. 6; Fig. 8 is a sectional detail on line 8—8 of Fig. 1; Fig. 9 is a side elevation in which the forward end of the machine is at the right and the rear end at the left (just the reverse of Fig. 1), and Fig. 10 is a sectional view on line 10—10 of Fig. 9, illustrating particularly the improved connection between the shake-frame and

means for vibrating the same; Fig. 11 is a detail sectional view of part of the flow-box shown in Fig. 1, and Fig. 12 is an elevation of part of the feed end of the machine showing a modified construction of flow-box.

The shaking-section or shake-frame of the machine includes a pair of longitudinal side rails 6, the inner ends of which may be supported in any suitable manner. In the construction shown (see particularly Figs. 6 and 7) the machine-frame 5 on each side of the machine is recessed to form a pair of ears 7, 7' and between each pair of ears is pivoted a support, which, in the preferred form of the construction consists of a block 8, the connection being formed by means of a pivot bolt 9, which passes through the ears and the block. This construction permits the shaking-section rails, which are connected to the supports in the manner to be hereinafter described, to have a vertical adjustment at their other or forward ends, the supports 8 during such adjustment turning on the bolts 9 as pivots. In other words, the shake-frame (of which rails 6 are part) may be tilted on the horizontal axis of bolts 9.



In order to provide for the lateral movement of the rails 6 produced by the usual vibration of the shaking-section, the rails are preferably pivotally connected to the supports 8. As shown, the top face of each block 8 is provided with an upwardly projecting circular boss 10, which engages a counterpart recess in a cap-piece 11. This cap-piece 11 is formed with a circular boss 12 which engages a corresponding circular recess in the underside of the end of its rail 6. A bolt 13 fastens each rail 6 to its cap-piece 11. By the construction which has just been described, it will be seen that each of the rails 6 is so supported as to be capacitated to receive a vertical movement and a horizontal shaking movement.

The outer ends of the side rails 6 are connected by a frame which preferably consists of a U-shaped casting 14, similar to that shown and described in Patent No. 635,511, granted to Thomas H. Savery, October 24, 1899. The connections between the ends of the rails and the ends of the casting may be effected in any suitable manner; as illustrated, particularly in Fig. 5, the upper ends of the U-shaped frame are formed with

sockets 15, in which are mounted headed-sleeves 15. A cap 17 fits over the headed end of 16, and a circular boss 18 on the cap fits a depression on the underside of the end of rail 6. A pin 19 on the cap engages a socket in the rail and prevents relative turning of these parts. The parts of the structure may be tied together in any suitable manner. As shown, long bolts 20, 20, are employed, one at each end of frame 14 passing through rail 6, cap 17, sleeve 16 and frame 14 with a nut on its lower end.

The U-shaped frame 14 is provided with suitable bearings for the breast-roll 21. In the construction shown (see Figs. 1 and 5), these bearings are formed by vertically adjustable brackets 22, each resting against an adjusting-screw 23.

In order to stiffen the shaking-section and particularly the rails 6 thereof, suitable struts 24 are employed, one for each rail (see Figs. 1 and 2), each strut being connected at one end to the inner end of its rail 6 with an interposed block, and at its other or outer end to the U-shaped frame 14. At said outer end each strut is riveted to the flange 25 of a sleeve 26 which latter fits into a recess 27 (see Fig. 5) of the frame 14 and is therein traversed by bolt 20. To further strengthen and stiffen the structure, each rail 6 and

In general, the construction of the parts heretofore described in detail, and of other parts, such as the deckle straps 105 (only one of which shows in Fig. 1) and wash troughs 106, one for each strap, is such as is well-known and disclosed in prior patents. The improvements constituting the present invention reside in parts about to be described.

40, 41, are two beams preferably I-beams, joined at one end by cross-braces, 42, 43, of X-shape, and joined at their other end by a cross-brace 44 (Fig. 3). The rigid base-frame thus constituted is pivotally supported at its inner end by two upwardly extending curved arms 45, 45, rigidly secured at their lower ends to the inner ends of beams 40, 41, respectively, said arms at their upper ends pivoting on the projecting ends of bolts 9, 9. The common axis of said bolts thus constitutes a single axis on which the rigid base-frame and also the shake-frame pivot in the tilting thereof (and parts mounted thereon) to vary the inclination of the Fourdrinier part of the machine. At its other outer end the base-frame is suspended by means capable of a considerable range of vertical adjustment.

As shown in Figs. 1 and 3, the beam 40 has a forked extension 70 embracing a vertical standard 71 and a block 72 movable vertically between guiding surfaces of said standard. Two links 73, 73, pivoted at their upper ends on opposite sides of block 72 and at their lower ends to the two arms, respectively, of the extension piece 70, suspend beam 40 from said block 72. By similar construction, beam 41 is suspended from a block 72', movable vertically in a standard 71' at the other side of the machine.

In each standard 71, 71', there is a vertically disposed rotatable screw-threaded or worm shaft 74 making screw-threaded engagement through the block 72 or 72' for raising and lowering the same upon rotation of the shaft. A worm wheel 75 (shown in dotted lines Fig. 3, and inclosed by a cover in Fig. 1) is secured to the upper end of each shaft 74. A horizontal worm-shaft 76 has threaded end parts engaging the worm-wheels 75, 75, a tubular central portion into which the threaded ends telescope and are secured, and hand-wheels 77, 77, on said ends, by which the shaft may be rotated from either side of the machine to change the elevation of the front end of the base-frame and hence the angle of inclination of the Fourdrinier part of the machine.

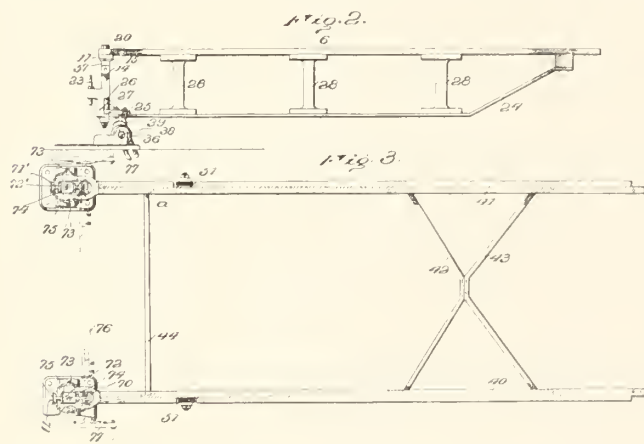
For the purpose of rigidly bracing the forward end of the base-frame against participating in the vibration of the shake-frame supported thereon by springs, 50, 51, two guides 60, 60, are provided, consisting preferably of angular castings secured to foundation plates by bolts 61 passing through slots in the castings. The vertical face of each casting is faced with a brass plate 62, which bears against the smooth upright face of a block 63 (preferably of iron) of which there is one secured to the inner face of each of the beams 40, 41. An adjusting screw 64 for each guide enables its brass face to be moved into firm engagement with the block 63, thereby preventing vibration of the base-frame and its beams, while at the same time permitting and guiding said frame and its beams in the vertical adjustment thereof to tilt or vary the inclination of the shake-frame.

The forward end of the shake-frame is supported from the base-frame by two multiple-leaf flat spring bars 50 and 51. Spring bar 50 is clamped at its lower end between a block 52 and plate 53 by a bolt 54 passing through said block and plate and through beam 40, rigidly securing said parts to said beam. The lower end of spring bar 51 at the other side of the ma-

its strut 24 are connected by upright braces 28 of which three are shown.

30, 30, 30, are a series of plates suspended from the underside of each side rail 6 by bracket arms 31 (see Figs. 1 and 9). The plates 30 of the two rails 6, 6, support the bearings for the opposite ends of table-rolls 32, over which runs the usual Fourdrinier or making-wire 33.

Any suitable means may be employed for vibrating the shaking-section, but the connection from such means to said shaking-section is preferably that hereinafter described. To assist the shaking-action, and also to cushion the stopping of the shaking-section at each end of its vibration, we provide two coiled springs 35, 35, each housed in a telescopic casing comprising a fixed cup-like part 36 and a movable cup-like part 37, with the ends of the spring bearing against the bottoms of cup-like parts. The two springs and their cup-like casings are strung upon and supported by a rod 38 mounted in bracket arms on the machine base. A forked bracket-arm 39 depending from U-shaped casting 14 embraces rod 38 between the ends of the two movable parts 37, 37, of the telescopic casings. The slot of the forked arm 39 is elongated to allow for a considerable vertical adjustment of the outer end of the shaking section without disengaging said fork from the rod 38 and from between the casing parts 37, 37.



chine is similarly fastened to the beam 41. A bolt 55 and plate 56 rigidly clamp the upper end of each spring bar to a flat face of an outward projection 57 on the upper end of each arm of the U-shaped frame 14, beneath an over-hanging shoulder 58 on said projection.

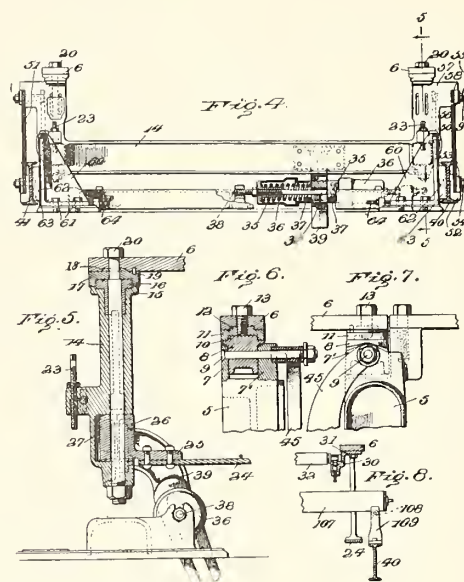
107, 107, 107, are save-all receptacles, each resting at its opposite ends on rollers 108, each roller being journaled in an upright 109 mounted upon one of the beams 40 or 41. Intermediate roofs 110, 110, rest on the save-all receptacles, and end roofs 111, 112, are supported partly by the save-all receptacles and partly by uprights 113, 114, mounted on beams 40 and 41. These roofs shed liquid falling thereon into the save-all receptacles 107.

The flow-box 80 is of approximate U-shape in side elevation, providing space between the upright arms thereof through which the shaft 76 passes. The inner end of arm 80' of the U-shaped flow-box has a vertically movable telescoping member, sleeve, or apron-part is 81, from which the liquefied pulp mixture is conducted onto the Fourdrinier wire 33 by an apron 82 fixed to and movable with said part 81. A link 83 (Fig. 1) connects beam 40 to part 81 at one side of the machine; a similar link, not shown, connects beam 41 to part 81 at the other side of the machine. It follows that any vertical movement of the front end of the base-frame and parts mounted thereon, including the shake-frame, making-wire and other parts, will impart corresponding adjustment to the telescoping part 81 of the flow-box and the apron 82 carried thereby. To provide a tight joint between the movable member 81 and the part 80' of the flow-box, there is provided a special packing consisting of rubber tubing or hose 83 (Fig. 11) positioned in a recess about the upper edge of part 80' and held in place by four wooden (preferably maple) strips 84 about the four sides respectively. Each strip is held by screws 85 adapted to be set up to further clamp the strips against the rubber tubing and thereby expand the same outwardly against the inner surface of part 81 to tighten the joint.

In the modified structure shown in Fig. 12, the inner arm 86 of the U-shaped flow-box is of the same height as the outer arm 87 thereof, and a sleeve or telescoping apron-board part 88 surrounds arm 86 below its upper end and is vertically movable thereon, sliding on brass angle strips 89 at the four corners thereof. The apron or apron-board 100 is fixed to and hence moves with part 88. The pulp mixture flows through an opening 101 in the wall of arm 86 of the flow-box onto apron 100. To prevent leakage between the parts 86 and 88, a packing, similar to that previously described with reference to Fig. 11, is positioned along the bottom and side edges of opening 101, the rubber tubing portion of said packing bearing against and making a tight joint with the apron-board part 88. A link 103 at each end of the part 88 connects the same to the side beams of the base-frame, imparting vertical movement of the latter to the apron-board part.

The machine herein illustrated is designed to provide for elevating the front end of the base-frame as much as from 16 to 18 inches above a horizontal position, and even this may be increased if desired. Ordinarily the shake-frame of paper machines is vibrated by a power-driven crank-pin connected to said frame through a pitman, bar or rod, of sufficient flexibility to avoid undue strain caused by relative movement of parts and ordinary adjustments. But for a range of adjustment such as provided for by the present machine, the mere flexibility of a pitman or connecting

rod is not adequate and satisfactory. Therefore, means have been devised such as illustrated in Figs. 9 and 10. As there shown, the end of a pitman or connecting rod 90 is supported by and works in a bearing 91 on a standard 92 at the side of the machine. The rod is sufficiently flexible and has sufficient play in bearing 91 to allow for slight sidewise movement imparted to its outer end by the driving crank-pin (or equivalent) not shown in the drawings. At its inner end pitman 90 has sliding connection with the shake-frame in the form of a collar 93 movable along a slightly curved rod 94 clamped at its ends in split lugs 95 and 96 on the U-shaped casting 14 of the shake-frame. The curvature of rod 94 is upon an arc having its centre in the axis (of the pivot bolts 9) on which the base-frame turns. It follows that any change in the inclination of the base-frame and parts thereon will simply cause the rod 94 to move in the collar 93 at the inner end of pitman 90, without the imposition of any strain on the connection due to such change of inclination or adjustment.



What is claimed is:—

1. The combination in a paper making machine, of a base-frame adapted to be raised and lowered at one end and pivotally supported at its other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by the base-frame and adapted to laterally vibrate independently of the latter and at its other end pivotally supported to turn about the aforesaid horizontal axis as it is raised and lowered with the base-frame; and means for raising and lowering the non-pivoted end of the base-frame.

2. The combination in a paper making machine, of two approximately parallel supporting beams adapted to be raised and lowered at one end and pivotally supported at their other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by the supporting beams and adapted to laterally vibrate independently of said beams, said shake-frame including side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the supporting beams; and means for raising and lowering the non-pivoted ends of the supporting beams.

3. The combination in a paper making machine, of a base-frame adapted to be raised and lowered at its forward end and including in its structure two approxi-

mately parallel beams, cross-bracing rigidly joining said beams, and arms extending upwardly from the beams at one end thereof, said base-frame being pivotally suspended to turn on a single approximately horizontal axis passing through the upper ends of its said arms; a shake-frame supported at one end upon the base-frame by spring bars permitting lateral vibration of the shake-frame independently of the base-frame, said shake-frame including in its structure side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the base-frame; means for raising and lowering the non-pivoted end of the base-frame; a making-wire extending over the shake-frame; and one or more save-all receptacles mounted on the base-frame beneath the making-wire.

4. The combination in a paper-making machine, of a base-frame including in its structure two approximately parallel supporting beams adapted to be raised and lowered at one end and pivotally supported at their other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by base-frame and adapted to laterally vibrate independently thereof, said shake-frame including side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the supporting beams; means for raising and lowering the non-pivotal end of the base-frame; and two adjustable guides having upright surfaces contacting upright surfaces of the two beams of the base-frame respectively at the non-pivoted end thereof to resist vibration of the base-frame with the shake-frame.

5. The combination in a paper making machine, of a U-shaped flow-box; a base-frame pivotally supported at one end and adapted to be raised and lowered at its other end; a shake-frame mounted on said base-frame; and means for raising and lowering the non-pivoted end of the base-frame, part of said means being positioned in the space between the upright arms of the U-shaped flow-box.

6. A flow-box for paper making machines having a fixed part and a movable apron-part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move one within the other in the movement of the apron-part.

7. A flow-box for paper-making machines having a fixed part or reservoir and a movable apron part sleeved about and adapted to slide up and down on said fixed part.

8. A flow-box for paper making machines including in its structure a U-shaped reservoir, a relatively movable apron-part associated with one upright arm of said reservoir, one of said parts being sleeved about the other whereby they move one within the other in the movement of the apron-part.

9. A flow-box for paper making machines having a fixed part and a relatively movable apron-part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move one within the other in the movement of the apron-part, and a packing positioned to prevent leakage between said parts and consisting of rubber tubing and clamping means adapted to compress said rubber tubing to form a tight joint.

10. The combination in a paper making machine, of a base-frame pivotally supported at one end; means for raising and lowering said base-frame at its other end; a shake-frame carried by the base-frame; a flow-box having a fixed part and a movable apron-part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move

one within the other in the movement of the apron-part; and connections from the base-frame to the apron-part of the flow-box raising and lowering the latter simultaneously with the base-frame.

11. The combination in a paper making machine, of a shake-frame; means for raising and lowering said shake-frame at one end to impart different degrees of tilt thereto; a driving rod or pitman for imparting vibratory or shake-movement to the shake-frame; and a sliding connection between said driving rod and shake-frame whereby the latter is adapted to be raised and lowered without corresponding movement of the driving rod.

12. The combination in a paper making machine, of a shake-frame; means for raising and lowering said shake-frame at one end about a pivotal axis at its other end; driving rod or pitman for imparting vibratory or shake-movement to the shake-frame; and a sliding connection between said driving rod and shake-frame working in an arc, centred in said pivotal axis whereby the shake-frame is adapted to be raised and lowered without corresponding movement of the driving rod.

METHOD OF DRESSING WOOD-PULP-GRINDING STONES.

Edward F. Millard, of Watertown, Mass., Patentee.

Patented in United States Patent Office, Nov. 24, 1914.

The inventor says:—

This invention is a method of uniformly developing the grit on the flat faces of lengthwise extending, peripheral ribs formed on stones for grinding wood into pulp for use in the manufacture of paper, particularly newspaper, and for forming, alternately with such ribs, lengthwise extending grooves that form channels for the lateral escape of the pulp from the stones during the grinding operation.

In the accompanying drawings, Figure 1 is a partial elevational view of the periphery of a pulp grinding stone dressed or fashioned according to my method; Fig. 2 is a partial end elevation of the stone shown in Fig. 1; Fig. 3 is an elevation of the plain-surfaced grinding stone, with a smooth roll extending across the periphery of the grinding stone and adapted to be rotated therewith. This view illustrates the first step in my new method. Fig. 4 shows the grinding stone after its surface has been subjected to the smooth roll shown in Fig. 3, and also shows, extending across the periphery of the grinding stone, a fluted bush-roll adapted to be rotated with the grinding stone and to effect the second and final step of my method, which consists in the formation of the alternating flat-topped grinding ribs in the peripheral surfaces of which the grit is uniformly developed, and the grooves that carry away the pulp during the grinding operation; and Fig. 5 is an end elevation of the form of the bush-roll used.

In accordance with this invention, after the grinding stone x has been first turned down peripherally to adapt it to frame containing wood pockets in a grinding machine (not shown), the turned-down peripheral surface is smoothed by the use of a smooth-surfaced roll y extending across the periphery of the grinding stone and rotated in connection therewith to literally crush down all the high points naturally or normally in the peripheral surface of the trued or turned-down stone x. This bush-roll is of steel or other hard metal, and has a smooth surface. The grind-stone x and the smooth roll y, each of which has a length greater than the thickness of the grinding stone, from side to side of the latter, are rotated for a sufficient length

of time to develop the grit of the stone uniformly around its periphery and from side to side of the stone.

I am aware that it is old to true grinding stones by rotating them one against another with their peripheries in contact. But such an operation necessarily develops high points and indentations on the peripheral surface of each stone, because every stone has some hard spots and some soft spots, and the hard spots or points of one stone will always indent the soft spots of the tone in contact. The purpose of running one grind-stone peripherally in contact with another is not to develop the grit of either stone uniformly but, on the contrary, to true the grind-stones and to develop

the ribs 2 serve to carry off the pulp laterally of the stone during the grinding operation. The bush-roll *z* is of a length that exceeds the width of the stone *x*, so that the alternating ribs and groove are uniformly produced and extend from one side to the other of the stone. The length of the bush-roll should at least equal the width of the stone. It is essential that the stone *x* and the smooth roll *y* (Fig. 3) be rotated at the same surface speed in order to crush down the high points uniformly and that the smooth roll be kept in rotation through this step, for if the rotation of the smooth roll be arrested and the stone allowed to rotate against the bush-roll while at rest, the surface of the stone will be glazed instead of having its grit developed. Wood pulp grinding stones the peripheries of which are thus formed can be used for the production of a finely ground pulp of unique character in respect of uniform fineness and improved quality especially desirable in the manufacture of all fibre newspaper. The pulp produced is of a uniform fibrous character, and when passed through any proper paper-making machine is converted into paper of uniform strength, of soft surface and of a minimized degree of brittleness, without incorporation of sulphite or other strength-giving material. Such paper is strong enough to run through high-speed paper machines, and the paper itself is strong enough to be run through high-speed machines, and the paper itself is strong enough to be run in printing presses. The ridges 2, as stated, are flat-surfaced or topped, and are preferably disposed three to the inch, around the periphery of the grinding stone. I am not aware that any pulp grinding stones have ever been dressed with continuous transverse, alternating ribs and grooves, nor am I aware that any one, prior to my invention, has ever developed or attempted to develop the peripheral grit of the stone uniformly by crushing the natural or normal high spots or points of the stone to the level of the soft spots.

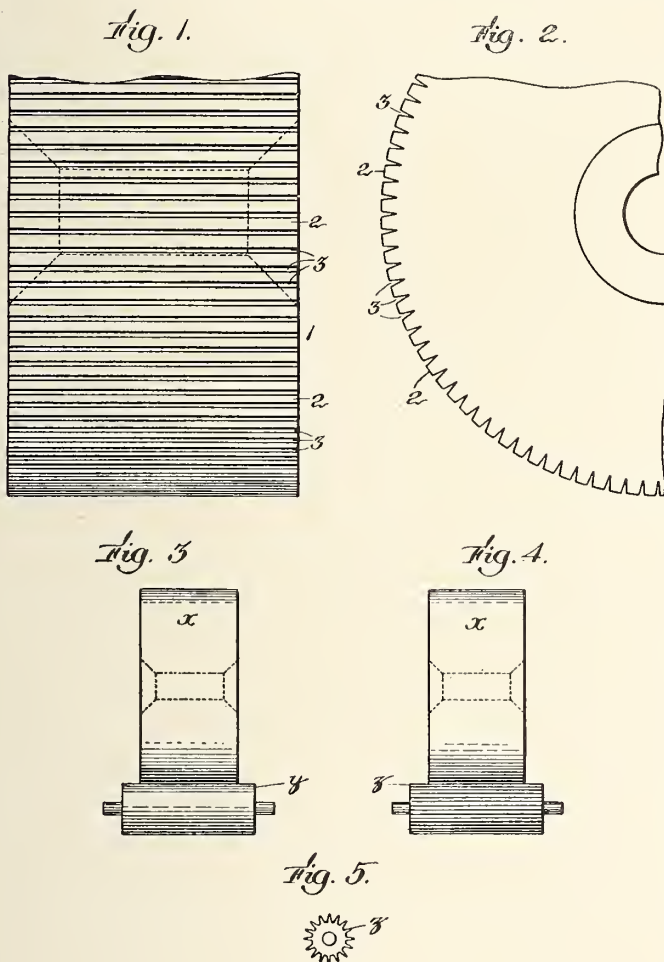
Having described my invention, what I claim as new and desire to secure by Letters Patent is:

The method of dressing the periphery of a wood pulp grinding stone, consisting in first crushing the high spots or points of the peripheral surface of a trued stone to the level of the low points or spots by continuous rotation of the surface of the stone and a therewith contacting smooth roll at equal surface speeds and thereby developing the grit uniformly across and around the periphery of the grinding stone; and secondly, in transversely and uniformly grooving and ribbing the levelled periphery of the stone from edge to edge to form a uniform series of transverse flat-topped ribs for grinding the wood and an alternating series of transverse groove for escape of the ground pulp.

THE PULP SITUATION IN MANCHESTER.

The Canadian Trade Commissioner at Manchester reports that future supplies of chemical wood pulp are causing considerable uneasiness to manufacturers and consumers. Not only is production at a standstill in the countries at war, but in Norway and Sweden the mills have been greatly hampered, and in many instances brought to a temporary standstill, owing to lack of coal and chemicals.

According to the Paper Trade Review, the imports of chemical wood pulp into the United Kingdom from all sources during 1913 comprised the following:—



relatively high and low points in order to cause the grind-stones to cut or grind by the action of the high points on tools presented. In the present instance, the object of subjecting the trued periphery of the stone to the hard, smooth roll *y* is to crush down all the high points to the level of the low and relatively soft points, and to obtain clear across the peripheral face of the stone a uniform or uniformly level development of the grit. In this way I obtain a grinding surface of uniform grit before transversely fluting or grooving the broken-down surface of the stone. In Fig. 4 this fluting or transverse ribbing of the stone is obtained by rotating the grind-stone, trued as shown in Fig. 3, in contact with a steel bush-roll *z* provided with alternating lengthwise-extending peripheral teeth and grooves. The teeth and groove are so formed that the ribs 2 of the grind-stone are left with their tops flat and characterized by the uniformly developed grit already described. The grooves 3 between

Bleached, dry, 20,621 tons; unbleached, dry, 374,684 tons; wet, 16,498 tons; total 411,803 tons.

The foregoing figures give an average weekly consumption of about 7,900 tons. The imports of dry unbleached (together with a small quantity of bleached) chemical wood pulp into the United Kingdom last year, from the undermentioned countries, were:—Russia 41,628 tons; Germany 400,972 tons; Austria-Hungary 1,761 tons; total 84,361 tons.

These sources of supply being cut off the British pa-

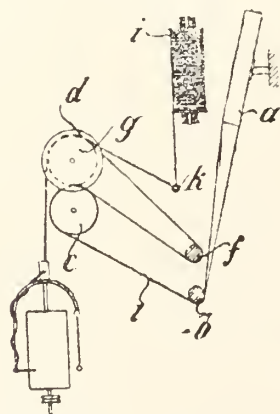
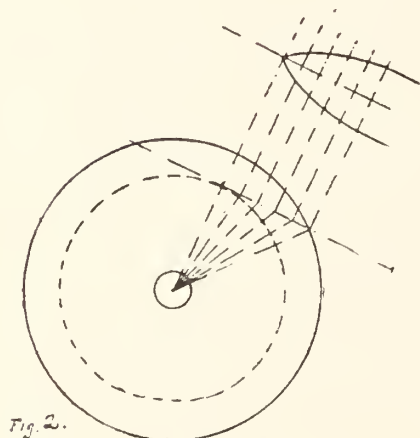
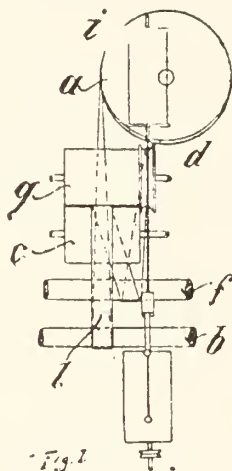
permaker has to face a weekly curtailment of some 1,600 tons. This of course will affect the imports into Manchester, which is one of the distributing centres for the supplies from Scandinavia and Canada.

Imports From Canada.

During the past few weeks, however, cargoes of wood pulp have been reaching this port rather freely, twelve steamers having arrived with an aggregate quantity of 106,000 bales, these figures including two shipments of about 40,000 bales of Canadian pulp from Chicoutimi.

DEVICE FOR SPINNING OF PAPER THREADS.

A recent German patent No. 272,903, by Mech. Seiler-warenfabrik Akt.-Ges. in Alf a. Mosel, relates to a



device for the spinning of paper threads, in which a paper strip, with the insertion of a textile thread, is rolled in on its two lateral edges. In accordance with

the invention, the paper strip conducted by the conveying rollers is led directly to the spindle over a tension roll, and around a guide roll, provided with a circular groove and rigidly connected with the upper roll of the two conveying rolls in such manner that the rotation of the spindle is transmitted to the groove of the guide roll. According to the inventors, this device has the advantage of very simple construction, and it is claimed that it supplies a faultless thread.

In the drawing, a form of construction of the invention is shown, in which Fig. 1 is a front view, Fig. 2 shows a section on roll (g) with circular groove, and Fig. 3 is a lateral view.

The paper strip runs from spindle (a) over guide rod (b), through the conveying rolls (c) (d), from there back over a guide rod (f) and from there over the grooved disc (g) to spindle (h). If a textile thread is to be rolled into the paper thread, the former is carried from spool (i) through eye (k) to the grooved disc (g).

The flat paper strip (l) passing through the conveying rolls and over the guide by the grooved disc (g), the grooved roll acting as a funnel.

In Fig. 2 is shown the effective section of disc (g) and it may be seen in this figure in what manner the circular grooved roll operates as a funnel.

AMERICAN FORESTRY ASSOCIATION MEETS IN JANUARY.

In order to aid in outlining details of the important work it is to do next year, the American Forestry Association has invited leading Foresters throughout the country to attend its annual meeting in New York City on Monday, January 11th, at the assembly room of the Merchants' Association of New York in the Woolworth Building. The meeting is for the purpose of discussing the best service the Association can render to various phases of forestry, lumbering and the paper and pulp trade.

Chief Forester Henry S. Graves will speak of what the Association can do to aid the Forest Service, various state foresters will speak of what can be done in State Forestry, and other experts will discuss other forestry problems.

J. E. Rhodes, of Chicago, Secretary of the National Lumber Manufacturers' Association, has been invited to address the meeting on "What the Association can do to aid the lumbermen," and E. A. Sterling, of Philadelphia, the well-known forest and timber engineer, will speak on "The Relation of the Public to a Sound Economic Basis in the Lumber Industry." E. T. Allen, forester of the Western Forestry and Conservation Association, of Portland, Oregon, and western representative of the American Forestry Association, will speak on "What the Association can do on the Pacific Slope," with special reference to the big public meeting which the Association plan to hold at the Panama-Pacific Exposition next July.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Wood End Container Corporation of Sanborn, N.Y., has given up its plant in that village and has consolidated with the Tonawanda Board and Paper Company at Tonawanda, N.Y. The machinery was moved from Sanborn on December 1.

* * *

The American Forest Products Corporation, of which Judge Vasco P. Abbott is president, was chartered during the past fortnight at Albany, N.Y., to deal especially in Canadian pulp wood, although its operations will not be confined to Canada. A. P. McKinnon is secretary and A. Bron Carter treasurer of the new company. John N. McDonald will be manager. The main office will be in Carthage.

* * *

Another incorporation of interest is that of the Southern States Pulp and Chemical Products Company of Philadelphia, Pa. The charter was filed last week in the State of Delaware with a capital stock of \$1,000,000. The new company will carry on the business of importers and exporters in paper and paper materials.

* * *

A despatch from Bangor, Me., says that according to Nathaniel M. Jones, now of St. John, N.B., where he is manager of the Edward Partington Pulp and Paper Company's various mills, pulp is still being imported from Germany, and the mills in that country are running and shipments are being regularly made, 1,000 tons having been received in New York last week. Mr. Jones was greatly surprised to learn of this fact in Boston, New York and other Eastern cities, where he had expected to get orders for pulp, resulting from an increased demand that it has been supposed would be created by the European war. The Partington Mills produce 120,000 pounds of bleached sulphite fibre per 24-hour day and there has as yet been no extra demand for the product.

* * *

The cutting of pulp wood in the north woods of the Adirondacks is booming at this time. Altogether there are now in the woods in that section over 200 wood-choppers and teamsters, and well over 24,000 cords have been cut.

* * *

The receivers of the Battle Island Paper Company held a conference on December 2 at 11 a.m. with Judge Ray in Norwich, Conn., for the purpose of examining and passing upon the report and account of the receivers, which report and account, inclusive of an unliquidated claim against the State of New York for \$1,800,000, and property and assets in Canada appraised at \$383,000 shows assets of the bankrupt concern aggregating \$2,460,215.88. The question of allowing the receivers, Gannon, Spencer and Mitchell, of Syracuse, \$7,000 was also discussed.

* * *

Two tons of sorghum bagasse, the waste product of the sorghum syrup industry, were tested in a commercial way in a straw board mill at Coffeyville, Kan. The test was successful and manufacturers pronounced the board suitable for certain classes of commercial work.

Construction of the big addition to the plant of the Kalamazoo Vegetable Parchment Company at Kalamazoo, Mich., was begun on December 1. The new building will be of the same size of the present plant, giving the company just twice the room for its business that it now has.

* * *

The Tissue Division of the American Paper and Pulp Association, held a meeting recently at Albany, N.Y., and H. H. Bishop was chosen secretary. The division made an interesting change in its plan of organization. Under the new plan there will be six sub-divisions. The idea in this plan is to bring the members of the various sub-divisions into separate conference. These sub-division are as follows: Toilet, towels and napkins, high grades, white and colored, Manila and No. 2 white, waxing tissues, paper stock tissues. Under the head of "Paper stock tissues" only manufacturers of tissue from old papers are included.

* * *

Complaint against the advance in rates on wood pulps, etc., made by the Ann-Arbor and other Eastern railroads in Eastern territory, effective November 16, was filed with the Interstate Commerce Commission at Washington by the Pulp and Paper Manufacturers' Association on December 1. From the nature of the complaint it is understood that the advance complained of is in consequence of the general advance in freight rates permitted by the Commission in Central French Association territory in the so-called advance rate decision handed down last July.

PAPER SHOES FOR MEN IN THE FIELD.

At a recent session of the war committee of the German Papermakers' Association consideration was given to the feasibility of manufacturing foot coverings for the men in the field from toughened paper. During the Russo-Japanese war, the Japanese troops were supplied with foot coverings and other articles of clothing made from paper, which, during the winter campaign, afforded excellent protection against cold and wet. The paper used for these articles, made from the fibres of plants grown for the purpose by means of the Japanese method of papermaking, was almost untearable and apparently waterproof. The footgear was stitched with thread in the same way as fabrics, being formed into short socks having soles and gaiter flaps. Similar articles of paper underclothing protected other parts of the body.

The paper was of a light yellow color, cross-ribbed in both directions on each side.—Paper, Inc.

Harold Richard Dunn, who for the past two years has been on the city selling staff of the Victoria Paper and Twine Co., Toronto, has enlisted with the second Canadian contingent and is now quartered at the Exhibition Grounds, Toronto, with the Twentieth Battalion as color-sergeant. Mr. Dunn had several years' military training in the Old Country and saw service during the campaign in South Africa.

Conditions in Norway and Denmark

Report of Mr. C. E. Sontum, Commercial Agent, Dept. of Trade and Commerce.

The Paper and Pulp Market.

Christiania, Norway, November 3, 1914.

The Norwegian trade paper "Tidsskrift for Papirindustri" in their issue of November 1 writes as follows:

Prices for news in rolls have been very irregular and changing almost daily. As mentioned before, one contract was closed at 220 kroner (\$58.06) per ton (metric), probably owing to the panic in England at the beginning of the war. It is expected, however, that more regular prices will be quoted in the future.

The prices for grease-proof and glitted grease-proof are still showing a tendency to rise and the demand is good. Other kinds of paper on the other hand, such as tissue, M.G. cap and newspaper of light weight are very little in demand. The markets for these varieties have been China and other over-sea countries. The supplies, therefore, have now to be stocked and the machines for making these kinds of paper are out of work and some of the mills have had to let their workmen go.

It is impossible to determine prices for the near future, as they are changing every week. It is reasonable to expect, however, that inquiries will soon be received. The German, French and Belgian markets are closed for export, and their customers will have to get their supplies from other countries.

Market for Cellulose.

The cellulose market is at present very quiet. The reason is that Swedish manufacturers have been clearing out their stock and it is noted that the import to Great Britain from Sweden during the last few weeks amounted to 25,000 tons (English) a week, while Norway has only shipped about 5,000 tons.

It has now been confirmed that the stocks at the cellulose mills in Norway are very small, being very much smaller than at this time last year, for sulphite as well as for sulphate. On account of the large sales for prompt delivery which have been made during the war, the unsold quantity for delivery during the present year is also very small; the statistical position, therefore, is very favorable for the sellers.

Prices are firm, being quoted as follows:—Sulphite, bleached, per ton (English) about \$61.33; sulphite, easy bleaching, about \$46.67; sulphite, strong, about \$42.67 to \$44.00; sulphate, cellulose, about \$42.67. These prices are f.o.b. Norwegian shipping port and net cash against documents.

Wood Pulp.

The pulp market also is very quiet at present in spite of some inquiries. There should be a rise in prices as the scarcity of the water supply is making itself very much felt and more so every day.

The Norwegian trade paper "Farmand" in its issue of November 24 thus reviews the situation:—

Those who expected a great boom in the paper trade as a consequence of the war have been sadly disappointed. In the first days of panic, it is true, fabulous prices were asked, and in isolated cases they were also paid. But the market soon lost its anxiety and to future supplies and the tone has become more and more quiet, with a gradual slowing down of business.

The demand for moist mechanical wood pulp has temporarily disappeared almost completely, chiefly as

a result of the large importation into the United Kingdom on the reopening of shipping and of the continued interruption of shipments to France and Belgium. Reports published in the daily papers with respect to the water scarcity are by no means encouraging. In large districts of Norway the farmers will have to cart water over long distances for the cattle and conditions are just as bad in Sweden. The output of mechanical pulp during the winter will therefore be greatly restricted, unless heavy rains are soon experienced. The opinion, therefore, may still be expressed that prices will be adjusted on a higher level than before the war.

Dry mechanical pulp is, on the other hand, in good demand at advancing figures. This is, however, of comparatively little interest to Norwegian makers who produce only small quantities of dry pulp.

Cellulose is firm, but very quiet.

The managing director of one of the mills of a leading paper pulp company, informed a newspaper representative that one of their paper mills will be run on short time, and that from next week it will only be run four days a week, the reason being shortage of orders. This will affect some 200 workpeople who will get fewer shifts. Some newspapers had predicted a boom in paper and cellulose during the war, but the reverse has happened. The demand is much below the normal, and prospects are far from good. At the outbreak of hostilities there was a spurt, but since then the buying power has steadily decreased as the consumption is considerably less than before, probably because newspapers appear with fewer pages and the printing of books has almost ceased.

Effect of Water Shortage on Logging.

The continual drought, which has prevailed during the summer throughout Norway and which is still continuing, has caused considerable delay in the floating of lumber on most of the Norwegian rivers, while on several of the smaller rivers the floating has been practically a failure.

When the large quantity, which has been brought down to the Glommen river, the largest river in Norway, is taken into account, the situation in that district is not so bad. On most of the smaller rivers, however, there are large quantities of logs, which cannot be brought any further. This lumber will remain in the rivers over winter, and the frost and the moisture will likely damage it to a great extent. It is calculated that about 400,000 logs are thus lying in the rivers. As frost and snow may now set in at any time, there is only a small chance of getting this lumber down to the mills before the spring.

Swedish Paper and Pulp Market.

Reports received from Sweden indicates that the paper market shows signs of improvement, as Swedish paper is finding its way to South America and India. The Swedish paper industry at the opening of the war became very quiet simultaneously with the decrease of sales in the home market. The first weeks of the panic having passed the market has now settled down and the inquiries from abroad are increasing. This has special reference to news paper in the markets previously exploited by the German paper manufacturers. From Greece and Turkey inquiries for deliveries have been received with offers to pay cash in advance, which has not previously been the custom. There are even inquiries from Egypt and an Egyptian business man recently visited Sweden for this purpose. South American states, e.g., Bolivia, are experiencing a lack of paper and are trying to buy in Sweden. In-

dia, which up to the present bought most of her paper from Germany, is also inquiring for Swedish paper. The prices are good although lower than was hoped, and sales of news have taken place at kr 165.00 (\$44) per ton (English) f.o.b. the west coast of Sweden.

Inquiries for other kinds of paper are also increasing and prices are better, although the rise in prices does not keep pace with the increased cost of production. It has been possible however to demand stricter terms of payment.

As far as the export of pulp is concerned the increase is less marked, especially with reference to shipments to England. This, together with the shortage of water, has considerably decreased the production.

The cellulose market is unchanged and the prices are firm, but the mills hope during the winter to obtain higher prices as Finland, which is one of their severest competitors, has ceased to export.

Imitation parchment is in great demand and high prices are received. Kraft paper is also saleable at a higher price.

Shortage of Sulphur in Sweden.

According to the "Svensk Export" the prospects for the Swedish sulphite mills are not bright, since it is very difficult for them to obtain sulphur for producing their boiling acid. From Italy the export of sulphur is prohibited and from America, where supplies could be obtained, it is difficult to get the regular steamers to carry it. Very little sulphur is in the hands of speculators, and they therefore do not sell, unless a very high price can be obtained. The mills are now, however, making energetic efforts to get in a sufficient supply.

Swedish Pulp Prices.

The latest Swedish pulp prices quoted are as follows:

Mechanical moist white	\$10.67	to	\$12.00
Do., dry white	22.67	to	24.00
Sulphite, prime, easy bleached . .	44.00		
Do., strong	40.00	to	41.33
Sulphate, easy bleached, ordinary	40.00	to	41.33
Do., strong	40.00	to	41.33

All per English ton, f.o.b. Swedish ports.

NEW PROCESS FOR SAVING SULPHITE.

Mr. George C. Sherman, whose name has been connected with investigations on the slower running of paper machines in order to make greater profits, is now undertaking with Mr. Hall, a director of the Taggart Paper Company, and Fred. H. Clark, of New York, the formation of a company to be known as the Hall Process Corporation, incorporated under the laws of the State of New York, and has already begun business with offices in the Sherman Block in this city. The company has a capital of \$100,000.

The company, according to Mr. Sherman, "is organized primarily to introduce a new process and apparatus for making chemical pulp invented by Mr. Hall, and for which a patent is pending. Although the apparatus has not been fully installed, nevertheless the new process has been in partial operation at the mills of the Taggart Paper Company at Felts Mills and Great Bend for six weeks past with complete success. The inventor claims that he will be able to produce standard newsprint from ground wood alone, without the use of any sulphite.

"Mr. Hall is not ready to disclose all the details of his invention at present, but is willing to state that a very large increase in production will be secured for a given power. Moreover, the quality is greatly im-

proved, the fibres produced being strong, silky and uniform. Ground wood is always much cleaner than sulphite, and a better sheet of paper with respect to cleanliness is produced as the percentage of sulphite is reduced. Besides this, sulphite is gummy and sticks to the rolls of the machine, causing many breaks and a consequent loss in production. Further, sulphite and ground wood do not require the same amount of heat to evaporate the water from them, and fibre from sulphite contract differently from ground wood, causing paper often to curl on the edges, making trouble on the press. But perhaps the most important result of Mr. Hall's process is that it makes ground wood fibres as uniform in length, thickness and strength as sulphite. This uniformity makes it possible to form a sheet of sufficient strength for commercial requirements solely from ground wood, and therein, of course, lies its practical value.

"It is impossible to make ground wood with any degree of fibre uniformity under the old process. The stone is sharpened by the use of a jig, and grinds until it is dull or glazed over, when it is sharpened again. The quality of the product is constantly changing, and in actual practice is never uniform. Mr. Hall has invented an apparatus which diminishes the power required, and at the same time preserves practical uniformity of product. Under the old process of making newsprint paper, long sulphite fibres are mixed with the necessarily diversified ground wood fibres. These diversified fibres are reinforced by the sulphite fibres to provide requisite tensile strength for the sheet of paper.

"The company will also render services in connection with giving expert engineering and cost accounting advice, but this feature of its business will only be advisory and incidental to its main purposes, and it will not enter the field already occupied by engineers and accountants."

Mr. Hall, the inventor of the new process, who has been for several years the general superintendent of the St. Regis Paper Company's mills, left the employment of that company last week. Although he will retain his residence in Carthage, he will have an office with the Taggart Paper Company suite in the Sherman building here. He is considered one of the best-versed men in the State on the subject of the grinding of pulp and paper-making.

HARD PAPER DRINKING TANKARDS.

Owing to the requirements of the troops passing through that city, a Dusseldorf manufacturer has presented to the National Women's Association 10,000 hard paper drinking tankards, made on his special machines. They are cylindrical in shape and of wound gray paper, 3 1-5 inches in diameter and 4 inches high, internally coated with paraffin. These tankards are produced so cheaply that hot or cold beverages can be supplied to soldiers on the trains, to be consumed while travelling, the receptacles being then thrown away to save rinsing. This fact alone has so far rendered them specially applicable to the Dusseldorf Red Cross Hospital.

The machine winds five layers of paper (containing a large proportion of ground wood), bending them into a solid body and fastening on the cap. By the machine in question 15 to 30 tankards a minute can be produced. The base of the tankard can be put on by hand, by which means the paraffin can likewise be applied. The vessels can also be used as pasteboard boxes for keeping small articles.—Paper Trade Journal.

PULP AND PAPER NEWS

W. J. Gage, head of W. J. Gage and Company, Toronto and Kinleith Paper Mills of St. Catharines, has been elected president of the Toronto branch of the Victorian Order of Nurses succeeding the late Col. D. R. Wilkie.

The Riordon Pulp and Paper Company of Montreal, who have plants at Merriton and Hawkesbury, Ontario and turn out fifty thousand tons of sulphite pulp annually, have declared their regular quarterly dividend of one and three quarters per cent on the preferred stock of the company.

The total revenue of the province of Ontario for the fiscal year, just ended, including moneys borrowed within the twelvemonth, is \$19,577,414 and the total expenditure, capital and ordinary, about \$20,000,000. The biggest drop in the estimates was about half a million dollars in Crown Lands, the chief decline being in the revenue from timber.

H. R. Pousette, Canadian Trade Commissioner, Buenos Aires, Argentina, has written to several paper manufacturing firms pointing out the opportunities which exist for doing business in that republic. He says that, owing to the elimination for the present of competition from Germany, France, Belgium and Austria and the strong possibility of its being much weakened for a long time in the future, Canadian paper manufacturers have a most unique opportunity to gain a solid foothold in the markets of Latin America. Argentina has for some time been passing through a financial crisis but eventually she will emerge from it stronger and much wiser for the experience and better able to take advantage of her boundless resources. The Republic will be the first in South America to recover from the present situation and, therefore, should receive the earliest consideration. Mr. Pousette asks for the fullest negotiations and that firms send him information with regard to samples, prices, etc.

Many friends in the paper and publishing trade learned with regret last week of the death of Chester B. Ames, former secretary of the Printers Board of Trade, Toronto, and later manager of the Art Publishing Company, Toronto, who was found dead in a state room on a Mississippi steamer near Memphis, Tenn., with a bullet wound in his heart. Mr. Ames had left Toronto only a few days before and worry over business since the outbreak of the war is believed to have driven him temporarily insane. William Robert Orr, a former resident of Toronto, who has been connected with the newspaper business since 1891 and was President and General Manager of the Detroit "Saturday Night" also died last week. His father was for many years city auditor of Toronto.

At a banquet tendered Hon. W. H. Hearst, Premier of Ontario, by his many old friends and admirers in Sault Ste. Marie, Ont. at which over four hundred guests were present, the Premier announced that a vigorous policy of development of Northern Ontario would be pursued and referred to the legislation which will be passed at the forthcoming session of the Ontario leg-

islature permitting of the export of pulp wood where the timber has fallen or is going to waste, but re-iterated that Canadian mills would be amply safeguarded in the matter. He thought that allowing the cutting and export of pulp wood by the settlers would in a large measure relieve unemployment.

The new combination pasting machine, which was recently installed in the plant of Hinde and Dauch Paper Company of Canada in Toronto, for the making of wall board, fibre board and fibre boxes is now in operation. The machine is 100 feet long and 80 inches wide and has a capacity of twenty tons per day. In the production of the new lines jute, chip and filled board are used. The fibre boxes and containers are non-puncturing and waterproof and are being used largely for shipping purposes.

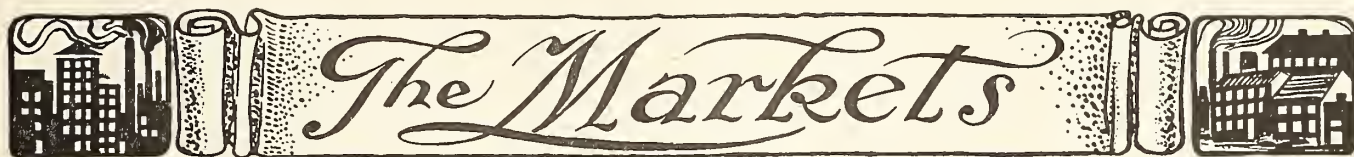
An order has been granted winding up the Owen Sound Lumber Company which was incorporated in 1910 with a nominal capital stock which was afterwards increased to \$200,000. A statement issued a few months ago showed that the company had a deficit of \$20,000.

Hon. Robert Jaffray, of Toronto, who is president of the Globe Printing Company, has been appointed president of the Imperial Bank of Canada succeeding the late D. R. Wilkie. Mr. Jaffray is eighty years of age but is very vigorous. The Imperial Bank is some times looked upon by the trade as the bank of the paper and pulp makers, in this respect, that a number of paper manufacturers in this line are shareholders and numerous paper firms carry their accounts in the institution.

Next month F. M. Ellis, who is in charge of the big envelope factory of Barber-Ellis, Limited, at Brantford, will remove to Toronto to take full charge of the buying and selling end of Barber-Ellis, Limited, relieving his father, J. F. Ellis, who, for over forty years has been identified with the paper trade and being in his 70th year, is desirous of being relieved of a portion of the heavy responsibility which he has borne as Manager and Treasurer of the company for such a long period. Charles G. Ellis, another son of J. F. Ellis, will become manager of the factory at Brantford, which, during the past year, turned out over three hundred million envelopes.

Some improvements have been made to the plant of the Dryden Timber and Power Co., Dryden, Ont. The smelter has been rebuilt as well as both sides of the recovery room. About one thousand tons per month of pure kraft fibre pulp are being turned out and a large proportion has been contracted for during the coming year. The company are now making a kraft sheathing paper, which is largely used by builders and for which the Standard Paper Co., George Street, Toronto, have been appointed selling agents.

Ritchie and Ramsay, Limited, Toronto, have just placed on the market a new brand of paper which will be known as "Kotedbond." It comes in sepia, white and azure and will take excellently half-tones and all fine art work. The firm report that during the past month their plant has been busier than any month since the outbreak of the war.



CANADIAN MARKETS

The news print mills continue busy and prices are firm. The outlook is not much changed from the last report, and the demand is good. Many contracts will be renewed within the next few weeks and some manufacturers think that the prevailing quotation will be about a dollar a ton higher than it was during the past year. Book and writing mills are not rushed but report that business seems to be picking up a little, although still spotty. The falling off in output since the war has been estimated from 10 to 20 per cent, but a number of firms, which have held back catalogues, are now taking fresh courage and going ahead with their undertakings in the printing line. Several printing houses in Toronto are figuring on large contracts after the first of the year. Business establishments are now getting used to the war and are talking more about business and less about the unpleasantness in Europe.

Wrapping papers are quiet in all lines. There is never much life to the trade during December and this year is no exception. No improvement is looked for until after the holidays. In the meantime many mills and warehouses are improving the time during the present month by taking stock. Others are conducting experiments on new lines and experts have arrived from foreign countries to try producing glassine, greaseproof, parchments and other ranges of paper. While some of these experiments have been fairly successful, they have not yet reached a stage where anything definite can be given out. Coated paper mills report that business is good to what it has been. The demand for ground wood pulp continues fair and prices remain about the same. Water conditions have improved with several mills.

Sulphite pulp shows a tendency to decline and as a result it is not thought that book and writing plants, whose contracts expire at the end of 1914 for sulphite will raise prices. Whatever increase there is in sulphite they will pocket the loss and continue to do business at the old figure—at least, for a while, as one of the largest producers remarked this week that, in his opinion, it would be unwise to elevate prices with the market for fine papers in the rather quiet condition that it is. During the past few weeks one leading firm received an order for about one hundred and fifty tons of art photo-paper, which is being used by a large catalogue house for printing half-tones in the place of coated stock, besides being considerably lighter and saving much in postage. Manufacturers of Canadian writing papers have placed some patriotic papetries on the market since the war which have had a big demand and other fancy lines of decorative paper, which formerly came from Germany, are being produced in the Dominion. A canvass made of the wholesale stationers and jobbing houses in Toronto during the past week elicits the information that business is very good, all things being considered, although orders from the West have fallen off considerably.

All business firms are being urged to use Made-in-Canada papers and statistics show that there has been about six million dollars' worth of foreign paper which

Canadians have been buying every year in preference to Canadian paper. The average price paid for this paper would run about twelve cents, and it, therefore, means that about fifty thousand tons have been imported, which a competent authority states would represent the annual product of seventeen mills employing about three thousand workmen, each supporting a family. He points out that quality for quality and price for price, the Canadian papers—except a very few brands which are not yet made in the Dominion—are superior to imported. Canadian business firms have not taken the trouble to ask for papers made in the Dominion. In fact, some influential houses which have recently sent out holiday literature talking up Made-in-Canada products, have had their printing done on German coated and other imported stock, and it is reported that one Canadian bank recently placed an order for several thousand dollars in calendars with a concern across the border. It would perhaps do many firms a world of good to practice a little more consistency.

In the rag and paper stock, business is quiet, and it is not expected that any material change in prices will take place until after the new year. Some lines are, however, holding their own but in the big centres things are slackening off and mills are purchasing cautiously and in limited quantities.

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.15 at mill, in carload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload) No. 1, \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.50.
 Glazed Kraft, \$4.75.

Pulp.

Ground wood pulp (at mill), \$16.00 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$45 to \$46, del. in Canada.
 Sulphite (unbleached), \$46 to \$47, delivered in U.S.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 up, delivered in U.S.

Paper Stock.

No. 1 hard shavings, \$2.00 to \$2.05, Toronto.
 No. 1 soft white shavings, \$1.85.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.00.
 Heavy ledger stock, \$1.50.

Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manila envelope cuttings, \$1.20.
 No. 1 print Manilas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$5.75 to \$6.00.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.50.
 Black linings, \$1.75.
 New light flannelettes, \$5.00.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 2¾ to 3.
 No. 1 burlap bagging, 95c.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manila 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manila, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 2, \$22 to \$24, delivered United States.
 Ground wood, No. 1, \$15 to \$16.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, N.Y., December 12, 1914.

During the interval there has been little change in the ground wood situation. Supplies for immediate delivery are rather scarce as most manufacturers have contracted for their entire output until the first of the year or later. Some mills are well sold up for a large part of their product for the coming year. There is a fairly large quantity of pulp being delivered to certain paper mills in this country at a mill price considerably below the present market value. It is said that it is now impossible to obtain any appreciable supply of ground wood for less than \$17.50 at the pulp mill for January delivery. That the value is held firmly by all grinders is not questioned by paper makers.

There has been a little more activity in the sulphite market, but the price tone is still somewhat weaker than a month ago. Prices of all grades of foreign cellulose have reflected an easier tone. It was reported that a Scandinavian mill offered 2,500 tons of strong unbleached e.i.f. American ports, 1.90c, for immediate shipment. The offer did not receive anything but indifferent replies from purchasers. It was said that the offer was probably made to clear the sulphite mills of all supplies on hand before the close of navigation. Bleached sulphite is rather quiet, and is quoted at 2.85c to 3c, ex dock. Easy bleaching is fairly firm at 2.20c to 2.30c ex-dock. Kraft is rather quiet and is weak for spot delivery and strong for contract shipment.

Both domestic and foreign rags have been inactive during the interval. The market has been featureless and weak. Linens can be obtained at lower prices than six weeks ago, despite the embargo on all grades of paper stock from Germany. There seems to be a fair storage supply available in New York at present. Roofing rags are dull and weak.

Bagging and rope are quiet and weak. Export business in waste twines and cordage is quiet as most consuming countries are involved in the European war.

Old waste papers were reported to be weaker and quieter than at any time this year. There is some keen competition among the packers of shavings on contracts with large printers and binderies for supplies covering 1915. Binders are asking higher prices for shavings than last year and packers cannot afford to pay the advances asked. Old Manilas and krafts are in quiet demand and weak in price. Book stock is moving better than any other grade but values are lower than a month ago. Mixed papers are moving at about the costs of packing and shipping.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2¼ to 2½, delivered.
 Unbleached Sulphite, imptd., 1.95c to 2.10c, ex dock New York.
 Bleached Sulphite, domestic, 3.35c, delivered.
 Bleached sulphite, impt., 2.85c to 3.05c, ex dock. New York.
 Easy Bleaching, impt., 2.20c to 2.30c ex dock, N.Y.
 Unbleached sulphate, impt., 2.00c to 2.15c ex dock, N.Y.
 Bleached sulphate, impt., 2.80c to 3.00c, ex dock, N.Y.
 Kraft Pulp, 2.00c to 2.15c ex dock, New York.

Paper.

There has been spotty buying in paper during the interval. Jobbers report in some cases a slight improvement to business in all grades. Mills anticipate a dull tone to business until well into next month after stock-taking and the closing of accounts for the year. With the opening of the stock exchanges in New York, there was a revival of optimism and the effect has been encouraging so far as talk in the trade is concerned. Collections were reported to be a little freer than for some time. A steady demand and normal contract consumption is the description of the newsprint situation. Contract renewals for the coming year have been rather slow in maturing. Prices for the coming year, it is thought by some may average about \$2.00 a ton higher than last year, owing to the higher costs of ground wood pulp. Sheet news remained steady at 2.30, New York. Side runs moved fairly well at current values. Wrapping papers reflected a quiet tone and were in poor demand. It was reported that prices on wood Manilas were rather weak. Other grades remained firm in value. Some manufacturers of bag paper were unable to deliver on contracts as they were without sufficient supplies of ground wood to make the paper. Book papers showed an improvement with the season publication business now on in full swing. Prices are firm, but unsatisfactory so far as profits are concerned. The mills which advanced prices in the west were forced to reduce them again on account of the falling off in demand. There has been a poor demand for boards of all grades and a number of mills have shut down. Prices remain unchanged. The tissue market was reported weaker and featureless as

far as the movement of any appreciable tonnage was concerned. Writings, bonds and ledgers moved quietly and with little snap. Prices were essentially unchanged. Cover papers and specialties were without much snap. Some colors are scarce and values are higher. Paper bag manufacturers have been curbing production on account of a poor demand. There are low stocks of bags in the hands of jobbers and it is believed that the turn of the year will bring a good demand and firm prices.

Quotations unchanged for all grades of paper:—

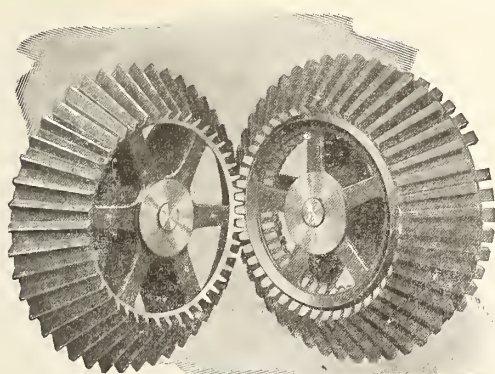
News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.30, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east Miss. R.
 Writing paper, No. 1, fine, 9c, del. east Miss. River.
 Writing paper, No. 2, fine, 8c del. east Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c, east Miss. R.
 Bond paper, 5c to 24c, delivered east of Miss. R.
 Ledger paper, 8c to 30c, delivered east of Miss. River.
 Linen paper, 7c to 18c, delivered east of Miss. River.
 Manila jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
 Manila, wood, 2.65c to 3.25c, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$27 per ton, delivered.
 Boxboards, straw, \$25 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 47 $\frac{1}{2}$ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

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Crepe papers of soft tough fibre are specially adapted to the production of articles such as socks, vests, etc., the demand for the army being exceptionally large and stocks of wool and cotton goods being very low.

German cigarette manufactures have been in the habit of using French papers, although German and Austrian qualities are equally as good. Manufacturers in the two last named countries are thus working to their full capacity. During the Russo-Japanese war, the Japanese troops wore socks and other garments of paper. The article was untearable and water-tight, being of a light yellow pulp color, and was made by a special Japanese process.—Paper Trade Journal.



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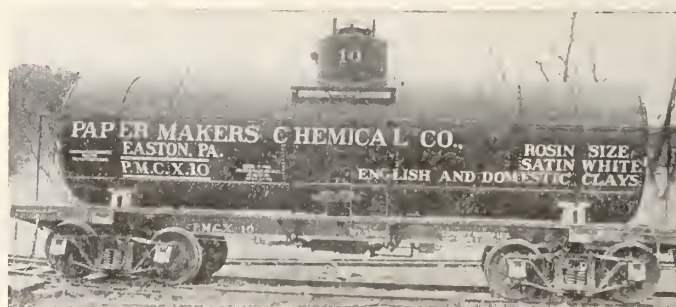
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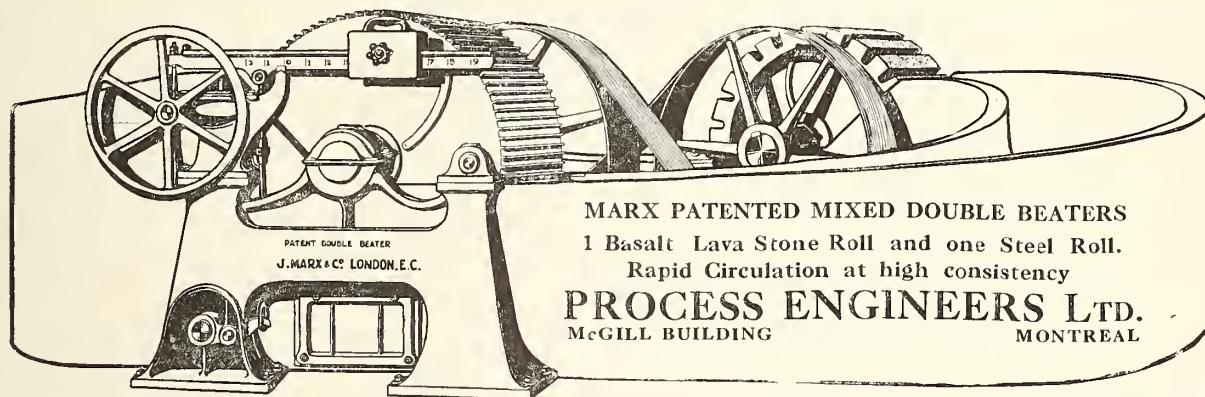
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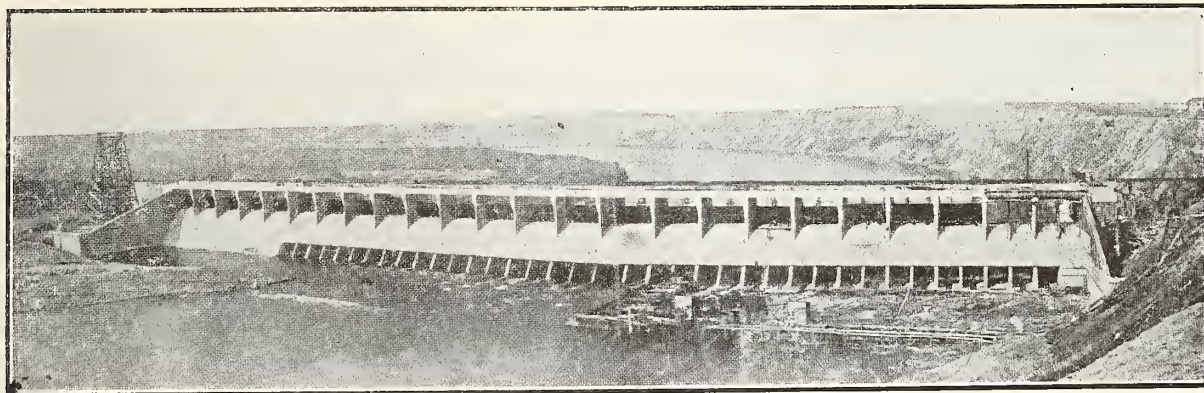
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(3) Tonnage Output; (4) Power Used; (5) Telegraphic
Addresses; (6) Agents, etc. Mill Productions classi-
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 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Pneumatic Chain Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Press Rolls**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Process Engineers Limited, Montreal, Can.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co. Ltd., Sherbrooke, Que.
 The Watrous Engine Works Co., Limited, Brantford, Ont.
- Pulp Stones**
 Lombard & Co., Boston, Mass.
 Stancliffe Estates Co., Ltd., Darley Dale, England
- Pumps**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Allis-Chalmers Ltd., Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Dillon Machine Co., Lawrence, Mass.
 Glen Falls Machine Works, Glens Falls, N.Y.
 Hamilton, Wm., Co., Peterboro, Can.
 Lawrence Machine Co., Lawrence, Mass.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Pusey & Jones Company, Wilmington, Del.
 Smart Turner Machine Co., Hamilton, Can.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Voith, J. M., New York, N.Y.
 The Watrous Engine Works Co., Limited, Brantford, Ont.
- Recording Gauges**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Recording Thermometers**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Refiners**
 Bertrams Ltd., Edinburgh, Scotland.
 Chambers Ltd., 152 Bay Street, Toronto.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Marx, J. & Co., London, E.C., England.
 Process Engineers, Ltd., Montreal, Canada.
 Pusey & Jones Company, Wilmington, Del.
 Rice, Barton & Fales Mach. & Iron Co., Worcester, Ma.
 Voith, J. M., New York, N.Y.
 Watrous Engine Works Co. Ltd., Brantford, Can.
- Rope Blocks**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Rope, Cotton and Manilla**
 Jones and Glassco, St. Nicholas Building, Montreal
- Rosin Size**
 Fox, Stockell & Co., London, Eng.
 Paper Makers Chemical Co., Easton, Pa.
 Process Engineers, Ltd., Montreal, Canada.
 Vera Chemical Co., North Milwaukee, Wis.
 Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- Rosin Size Boilers and Dissolvers**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Process Engineers, Ltd., Montreal, Can.
- Rotary Sulphur Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Canadian Pulp Mill Machinery Co., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
- Runways—Hand operated**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Save-A-Alls**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Pusey & Jones Company, Wilmington, Del.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Watrous Engine Works Co., Ltd., Brantford, Can.
- Screen Plates**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Screens**
 Bertrams Ltd., Edinburgh, Scotland.
 Bezner, Albert, 299 Broadway, New York City.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
 Glens Falls Mach. Wks., Glens Falls, N.Y.
 Harmon Machine Co., Watertown, N.Y.
 Jenckes Machine Co., Sherbrooke, Que.
 Johnson, Chas., St. Henry, Que.
 Marx & Co., J., London, England.
 Process Engineers, Ltd., Montreal, Canada.
 Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
 Tippet Arthur P. & Co., Montreal, Can.
 Voith, J. M., New York, N.Y.
 Watrous Engine Works Co. Ltd., Brantford, Can.
 Westbye, P. P., Peterboro, Can.
- Slings**
 Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Slitters and Re-Winders**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Cameron Machine Co., Brooklyn, N.Y.
 Chambers Ltd., 152 Bay Street, Toronto.
 Moore & White Co., Philadelphia, Pa.
 Pusey & Jones Company, Wilmington, Del.
 Ticonderoga Machine Works, Ticonderoga, N.Y.
- Smelting Furnaces**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Straw Cutters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Dusters**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Straw Digesters**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Strawboard Making Machines**
 Bertrams Ltd., Edinburgh, Scotland.
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Chambers Ltd., 152 Bay Street, Toronto.
- Steam Regulator**
 Pickles, W. F., Buckland, Conn.
- Stuff Chests**
 Boving & Co., of Canada, Limited, Toronto, Ont.
- Suction Couch**
 Process Engineers Ltd., Montreal, Can.
- Sulphite Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
 Stebbins Engineering and Manufacturing Co., Watertown, N.Y.
 The Watrous Engine Works Co., Limited, Brantford, Ont.
- Sulphate Mill Equipment**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 Process Engineers Ltd., Montreal, Can.
 The Watrous Engine Works Co., Limited, Brantford, Ont.
- Gauges**
 Schaeffer & Budenberg, Brooklyn, N.Y.
- Generators and Transformers**
 Chambers Ltd., 152 Bay Street, Toronto.
 Siemens Co., of Canada, Ltd., Montreal, Can.
- Grinders**
 Boving & Co., of Canada, Limited, Toronto, Ont.
 Carthage Machine Co., Carthage, N.Y.
 The Watrous Engine Works Co., Limited, Brantford, Ont.

MILL SUPPLIES---Continued

Sulphur

Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners

Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.

Tachometers (Hand and Stationary)

Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems

Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks

Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
The Watrous Engine Works Co., Limited, Brantford, Ont.

Thermometers

Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery

Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
The Watrous Engine Works Co., Limited, Brantford, Ont.

Travelling Cranes

Blethen, Hugh R., New York, N.Y.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.

Voith, J. M. Co., Inc. New York, N.Y.

Voith, J. M., Wurttemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Pusey & Jones Company, Wilmington, Del.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery

Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R., Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouatichouan Falls Paper Co., Ouatichouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon

Falls, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Donnacona Pulp & Paper Co., Donnacona, Que.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merriton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials

Bond

Canada Paper Co., Ltd., Montreal, Que., "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."

Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que., "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory

Department of the Interior, Ottawa,

Deputy Minister.

December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.
 Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
 Eastern Paper Co., Ltd., St. Basile, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper and Electric Co., Ltd., Campbellford, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Ford, R. & Son, Port Neuf, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 McArthur, Alex. & Co., Montreal, Que.
 McLeod Pulp Co., Ltd., Liverpool, N.S.
 Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Macleod Pulp Co., Ltd., Liverpool, N.S.
 Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks,"
 "Superior Translucent Bristol," "C.P.C. Coated Litho,"
 "Superfine Litho Blanks"
 Booth, J. R., Ottawa, Ont.
 Eddy, E. B. Co., Ltd., Hull, Que.
 Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Eastern Paper Co., Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
 Wentworth Paper Mills, West Flamboro, Ont.
 Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
 Georgetown Coating Mills, Ltd., Georgetown, Ont.
 National Paper Co., Valleyfield, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
 Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
 Eddy Co., The E. B. Ltd., Hull, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
 Kinleith Paper Co., Ltd., St. Catharines, Ont.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co., Ltd., St. Basile, Que.
 McArthur, A. & Co., Montreal, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, R. & Son, Port Neuf Station, Que.
 Montreal Paper Co., St. Basile, Que.
 Northumberland Paper & Electric Co., Ltd., Campbellford.
 Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
 Dominion Paper Co., Montreal, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Riordon Pulp and Paper Co., Merritton, Ont.
 Strathcona Paper Co., Strathcona, Ont.
 Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B. Ltd., Hull, Que.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, Alex. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Dominion Paper Co. Ltd., Montreal, Que.
 Dryden Timber and Power Co. Ltd., Dryden, Ont.
 New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
 Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd. Grand Falls, New
 foundland.
 Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
 Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
 Crabtree and Son, Edwin Crabtree Mills, Quebec
 Donnocona Pulp and Paper Co., Donnocona, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
 Jonquiere Pulp Co., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Lake Superior Paper Co., Sault Ste. Marie, Ont.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 News Pulp & Paper Co., Ltd., St. Raymond, Que.
 Powell River Co. Ltd., Powell River, B.C.
 Price Bros. & Co., Ltd., Kenogami, Que.
 Riordon Pulp and Paper Co., Ltd., Montreal, Que.
 Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
 Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
 Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, Joseph & Co., Port Neuf, Que.
 Ford, Rowland and Son, Port Neuf, Que.
 Montreal Paper Co., St. Basile, Que.
 Walker, J. R. & Co., 35 Common, Montreal, Que.
 Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Eastern Paper Co. Ltd., St. Basile, Que.
 Ford, J. & Co., Port Neuf, Que.
 Lazier Paper Mills, Ltd., Belleville.
 Lincoln Paper Mills Co., Ltd., Merritton, Ont.
 McArthur, A. & Co., Montreal, Que.
 Moira Paper Mills, Belleville, Ont.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 Trent River Paper Co., Ltd., Frankford, Ont.
 Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy, The E. B. Co., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
 Garden City Paper Mills, Ltd., St. Catharines, Ont.
 Interlake Tissue Mills, Ltd., Merritton, Ont.
 Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que.

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
 Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
 Booth, J. R. Ottawa.
 Brompton Pulp & Paper Co. Ltd., East Angus, Que.
 Canada Paper Co., Montreal, Que.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Northumberland Paper & Electric Co., Campbellford, Ont.
 McLeod Pulp Co., Liverpool, N.S.
 Western Paper Mills, Ltd., Vancouver, B.C.
 Wilson, J. C., Ltd., 61 St. Alexander St., Montreal, Que.

Wrapping

Booth, J. R., Ottawa, Ont.
 Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre,"
 "Invictus Fibre," "Hercules Manilla," "St. Francis Manilla," "Wave
 Crest Drug."
 Dominion Paper Co., Montreal, Que.
 Don Valley Paper Co., Ltd., Toronto, Ont.
 Eddy Co., The E. B., Ltd., Hull, Que.
 Ford, J. & Co., Port Neuf, Que.
 Ford, Rowland, Port Neuf, Que.
 Gore Valley Paper Mills, Dundas, Ont.
 Jonquiere Pulp Co., Ltd., Jonquiere, Que.
 Laurentide Co., Ltd., Grand Mere, Que.
 Canada Paper Co., Montreal and Toronto.
 See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
 Kinleith Paper Co. St. Catharines, Ont.
 Rolland Paper Co., Montreal, Que.
 Provincial Paper Mills Co., Ltd., Toronto, Ont.
 Toronto Paper Manufacturing Co., Cornwall, Ont.



THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
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Brown Bros., Ltd., 51 Wellington Street, W.
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Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street.
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

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Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. De Wolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
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Scandinavian American Trading Co., New York, N.Y.

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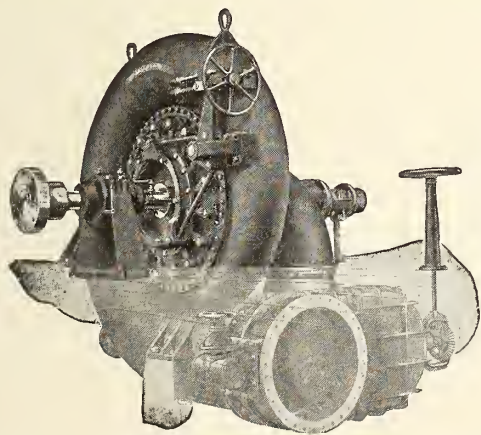
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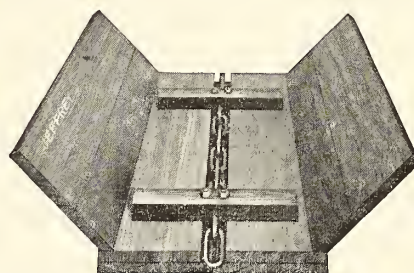
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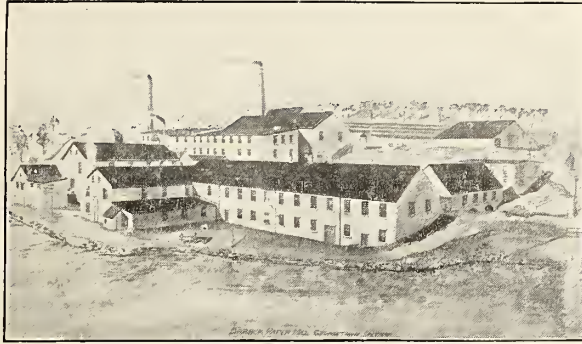
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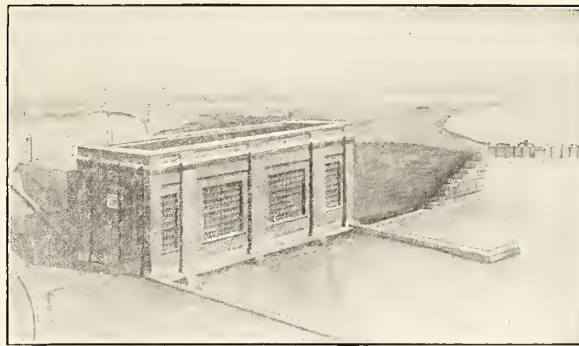
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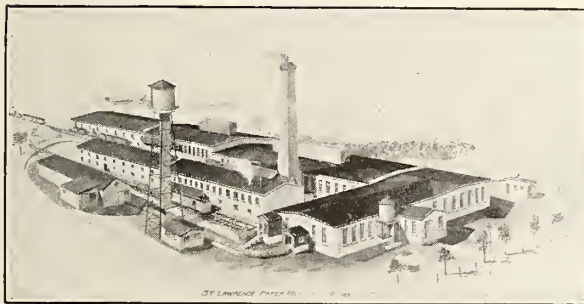
Barber Paper Mill, Georgetown, Ont.



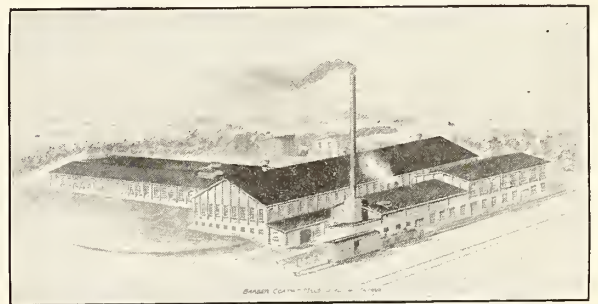
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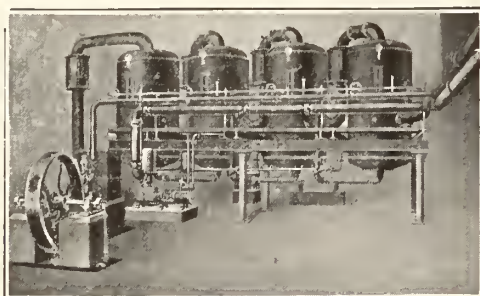
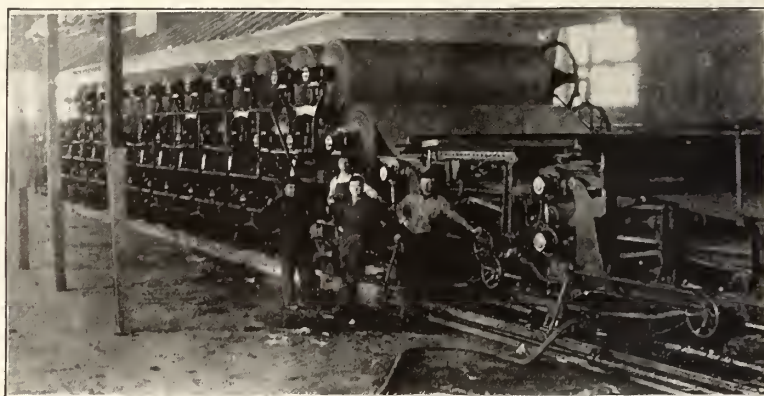
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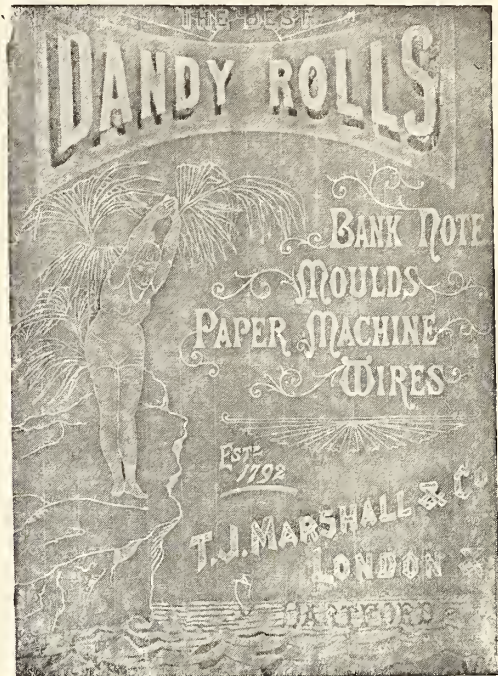
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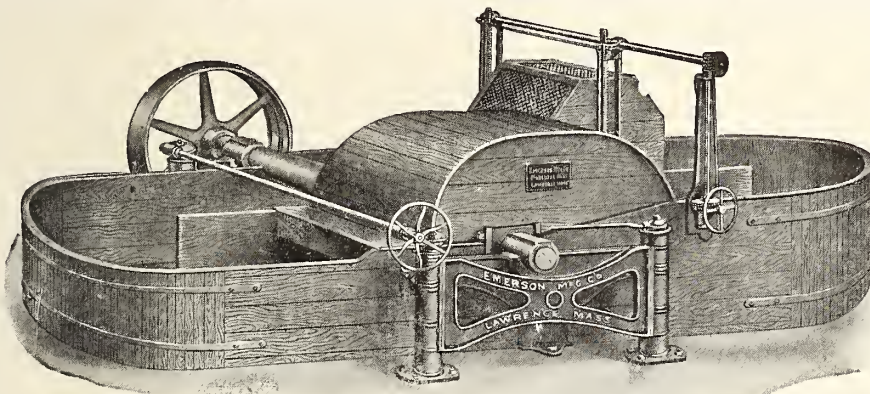
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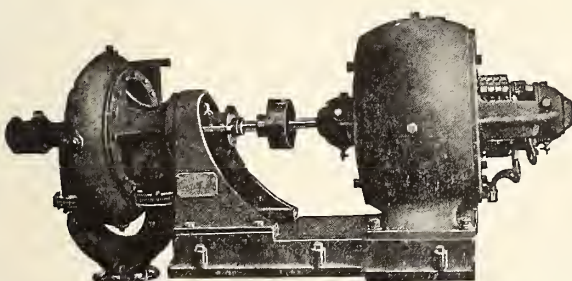
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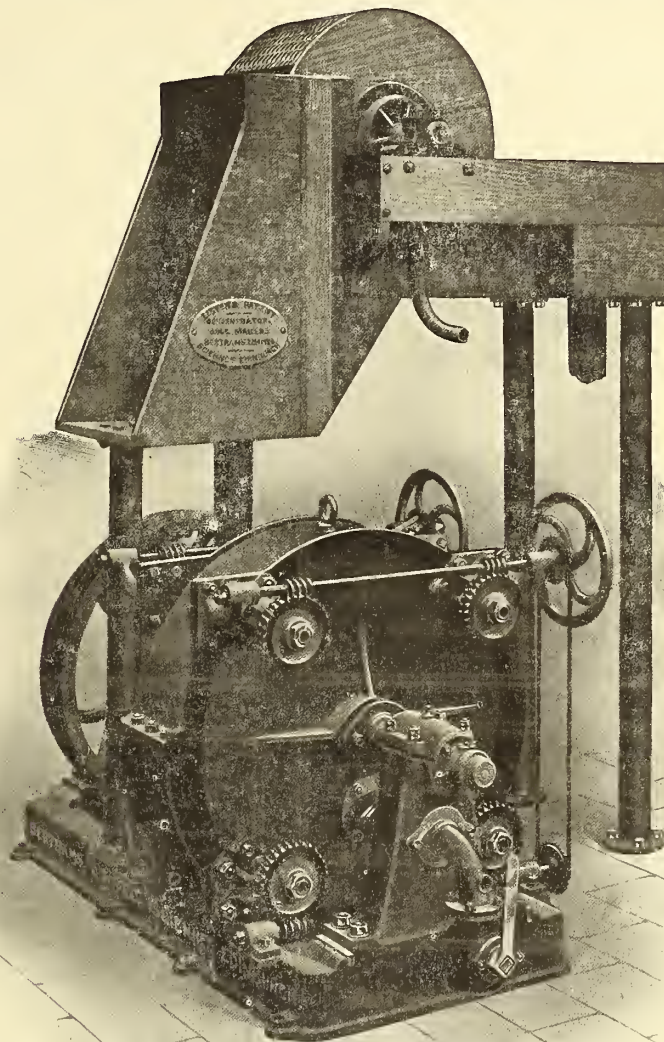
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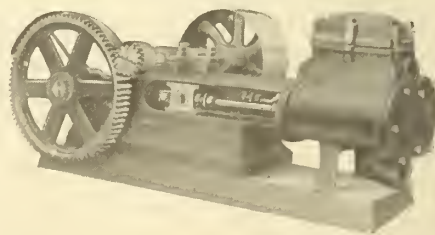
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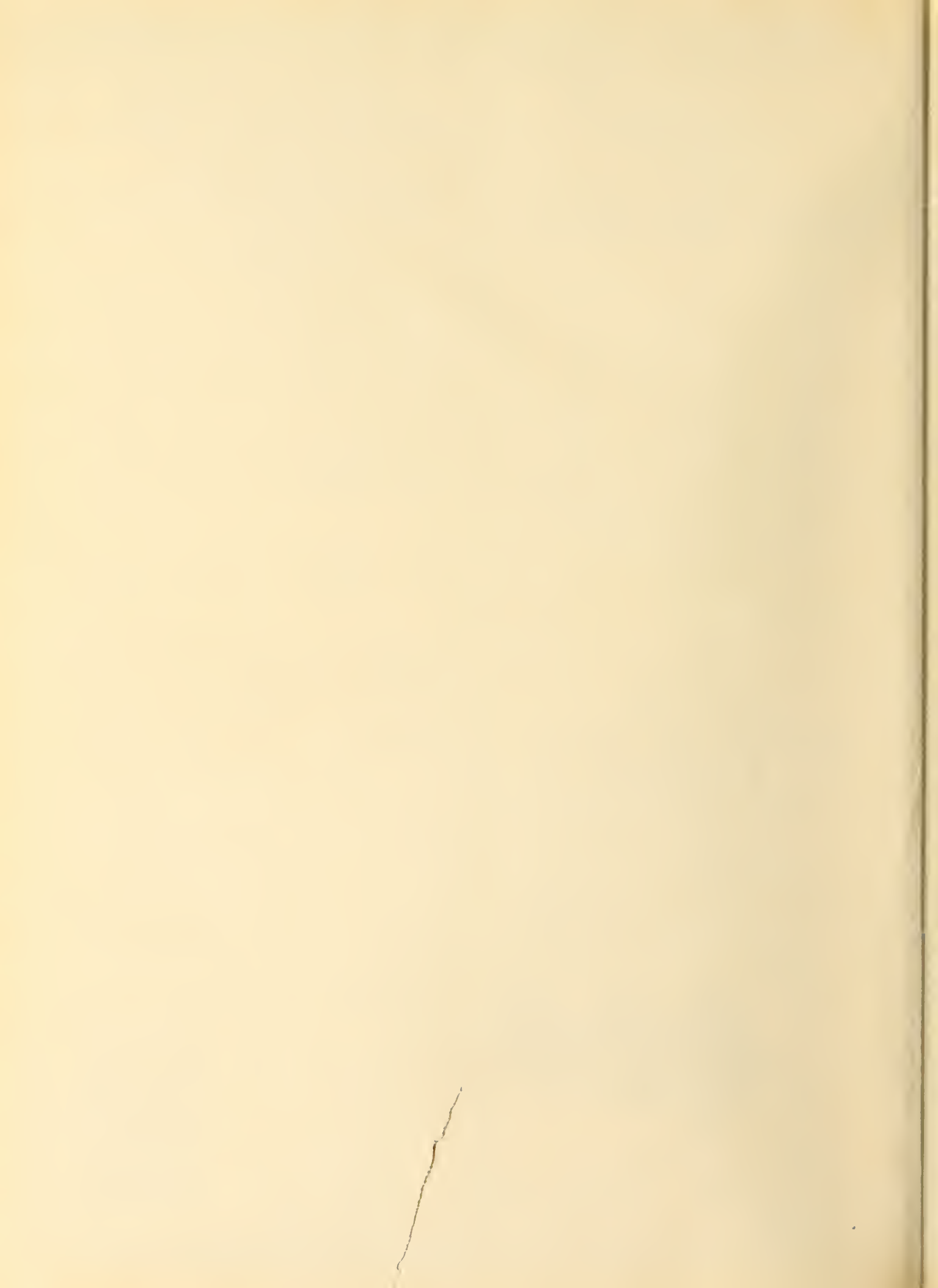
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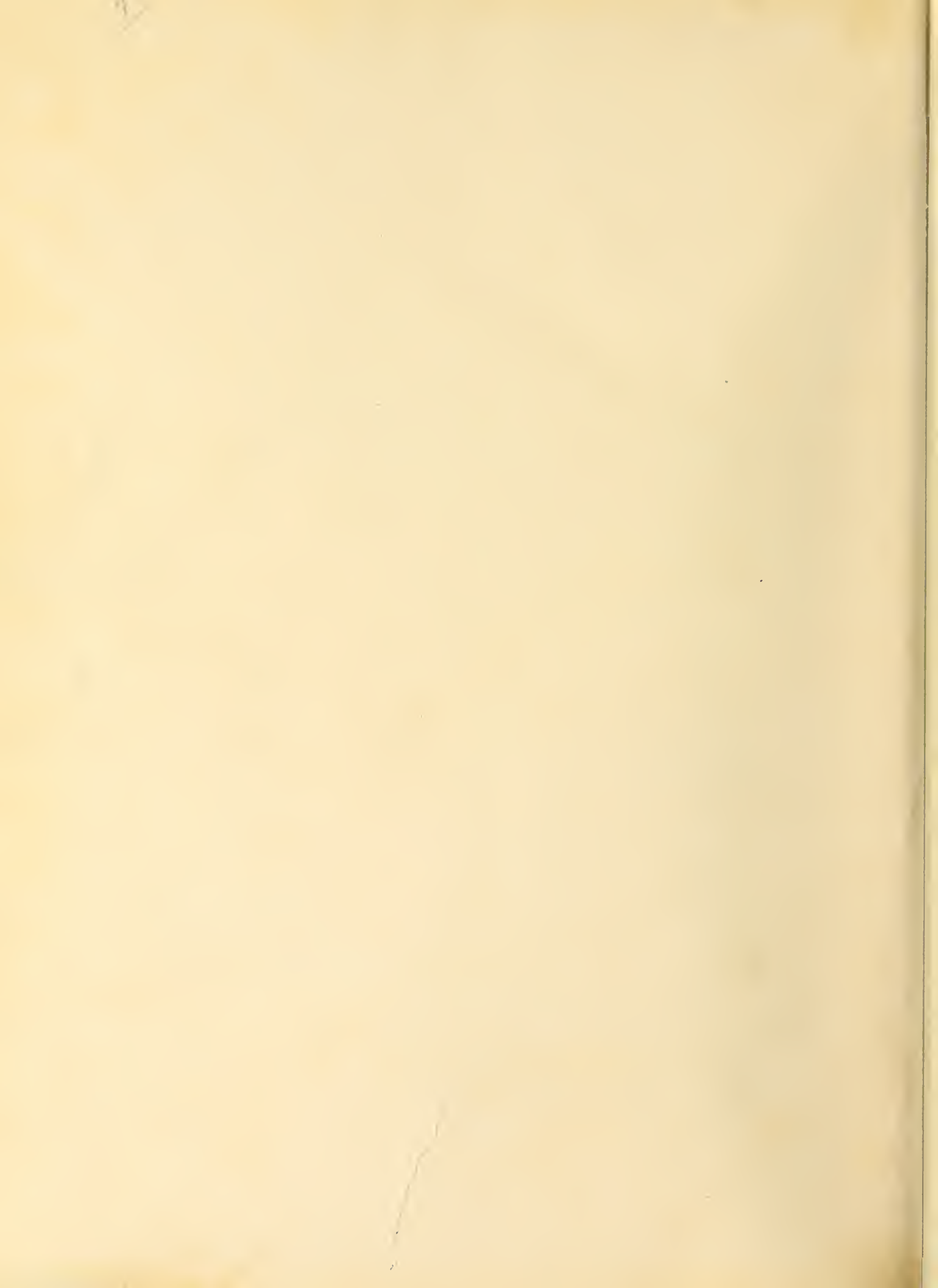
Our Motto: Satisfaction to every Customer.

The Smart-Turner Machine Co., Ltd.
HAMILTON CANADA



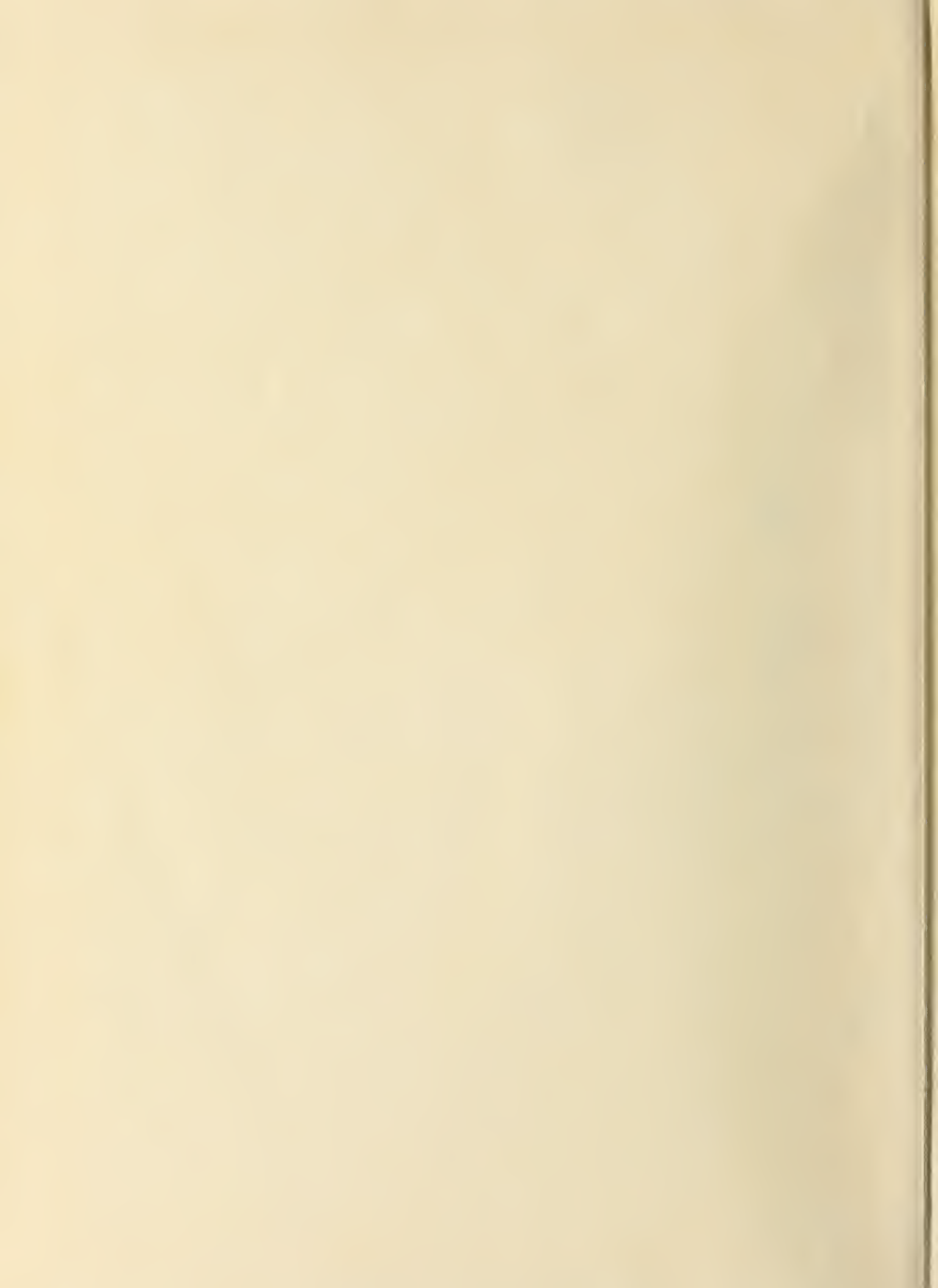












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